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AQUARIUS WebPortal

User Manual - v2016.2

June 2016

AQUARIUS WebPortal Version 2016.2

User Manual – June 2016 Edition

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1 Introduction

AQUARIUS WebPortal is a browser-based information and data presentation system integrating data collection, data storage, reporting, data computation, data management and real-time information display.

AQUARIUS WebPortal also includes a command interface system allowing commands to be sent via email or text message (SMS) with immediate response.

AQUARIUS WebPortal delivers Business Intelligence capabilities to AQUARIUS systems by transforming basic data into more meaningful information. Users can access real-time environmental data and Statistic computations from AQUARIUS Time-Series in a user-friendly display allowing them to immediately understand what is happening in their monitoring network.

- Statistics calculated from Time-Series can be overlaid on to maps, colour-coded against Legends to classify data
- Charts can be overlaid with coloured bands, lines and markers. (For example, environmental tolerances, water usage rights, flood/reservoir spill levels, etc.)
- Historic and Forecast data (if available) can be viewed on a Daily, Monthly and Yearly basis, allowing user to step through their data viewing results overlaid on a map, on a chart, or in a grid
- Various presentation views enables users to intuitively navigate back and forth between maps, charts, grids, reports and pop-up information windows

We hope your experience with **AQUARIUS WebPortal** is enjoyable and productive.

1.1 About this User Manual

This manual is intended to serve two main purposes:

1. To assist new users to quickly familiarise themselves with the AQUARIUS WebPortal product and become productive with it;
2. To provide a useful reference for users who have a reasonable understanding of the product.

The User Manual is fully interactive, by clicking on references to other sections, figures or tables the document will be redirected to the appropriate page.

For more information on how to use this User Manual, please see section 10.

1.2 Glossary of Terms

The Glossary of Terms contains Terminology that may be found within AQUARIUS WebPortal and this User Manual.

Standard **AQUARIUS Time-Series** terms are highlighted in bold text.

Terms	Definition
Account (User Account)	Details saved against a User which allow the User to be Authenticated and Sign In to AQUARIUS WebPortal
Activate/Active	(See also – Deactivate, Blacklist) An active item is one that will be available to be seen outside the Admin section.
Alert	An Alert is something in the WebPortal that will trigger based on an Alert Trigger. The Alert may then send a Notification to users in a Distribution Group.
Annual Frequency	Used to calculate Return Periods or Average Recurrence Intervals on Statistic Values
Anonymous	Using the WebPortal without first having Signed In with an Account
Approval Levels	The security level of data in AQUARIUS Time Series
AQIS	AQUARIUS Integration Services – WebPortal engine that performs background calculations and processes.
Authentication	Having a username and password checked to verify identity
Axes	See Chart Axis
Blacklist	(See also – Activate/Deactivate) Blacklist marks a Data Set as having bad data. The Blacklist is applied temporarily to a Data Set to ensure no Alerts are triggered based on this data.
Chart	An interactive graphical display of Time-Series data. Charts can be panned and zoomed.
Chart Axis	A Y-Axis associated with a chart. Each Chart Axis has its own scale, and can be aligned to the left or right.
Chart Data Set	A Data Set associated with a chart. A Chart Data Set contains a reference to a regular Data Set, as well as references to a Chart

	Axis and the display settings of the Data Set on the Chart.
Chart Overlay	Additional lines and bands of colour added on top of a Chart. Can be used to display levels and operating bands for example.
Clone	Copies the details of an item into Create Data Entry Form. This enables new data to be added quickly when it is similar to current data.
Contextual Help	Help link that opens the Help Manual and goes directly to the correct section (based on the section/tab currently displayed in the WebPortal).
CRUD	Create/Read/Update/Delete – The four standard permissions that can be assigned to the tabs within the Admin Section (through Security Roles)
Data Entry Form	The standard page seen for creating or editing data
Data Local Time	(See also – User Local Time/UTC) - The time at the particular Location being viewed
Dashboard	A screen which displays and organises a series of configured Widgets.
Data Set	Time-Series and Rating Curves in AQUARIUS Time-Series
Data Set Reference	Data Set References allow Locations to reference Data Sets at another Location, based on a meaningful relationship
Deactivate/Inactive	(See also – Activate, Blacklist) Deactivating an item is a way of soft-deleting. The item will act deleted by not showing up outside the Admin section, but can always be re-activated if needed again. A Data Set could be deactivated once it is no longer in service. When a licence limit is reached, new items are added as inactive by default.
Distribution Group	A grouping of People for the purpose of mass-distribution of Notifications
Easting/Northing	(See also Zone) – Geographic coordinate system which divides the Earth into grids and then uses the number of metres East and number of metres North within the grid Zone
Filter	A filter is used to get a sub-set of data within a Grid, filters are

	applied to columns
Folder	A grouping for Locations within AQUARIUS Time-Series
Forms Authentication	(See also Windows Authentication, Social Sign In) – Signing In to the WebPortal using a standard username and password
Grade Code	The quality of Time Series data in AQUARIUS Time Series
Grid	A table of data with additional features allowing dynamic filtering of columns and changing of the sort order. All grids can be exported to external file formats.
Heat Map	(See also Isoline) Images generated from interpolating Statistic Values and overlaid on the Map
Indicator	A shape displayed on the Map used to indicate a Location or Data Set, also used to display Statistic Values and show Legend classification through colouration
Info Request	A request for information sent via email, text message (SMS) or through the WebPortal that can return a simple text-based report
Interval	Latest or Periodic (incl. Daily/Monthly/Yearly)
Isoline	(See also Heat Map) Lines generated from interpolating Statistic Values and overlaid on the Map
Latest	Interval for Statistics that are relative to Now
Latitude/Longitude	Standard Geographic Coordinate System used by AQUARIUS Time-Series
Legend	A way of classifying Statistic values and States using colours and labels
Location	A place in AQUARIUS Time-Series represented by geographic coordinates (Latitude/Longitude or Easting/Northing) including an elevation
Longitude	See Latitude/Longitude
Map - Base Map	Map layer(s) used as the primary Map within the WebPortal
Map - Overlay	Additional Map layers that can be displayed semi-transparent

	over the Base Map
Northing	See Easting/Northing
Notification	A message sent out from the WebPortal via email and/or text message (SMS)
Panel	Additional windows shown on the left and right side of the WebPortal. Left is used for navigation and right for additional information. Both can be expanded/collapsed with the arrow buttons.
Parameter	Specifies what sort of data is stored in a Time-Series in AQUARIUS Time-Series
Parameter Range	Used to set up Range values against Parameters, Location Types and Locations – these can then be used to classify data
Periodic	Statistic Intervals that are broken up into standards of “Day”, “Month”, “Year”, “Decade”, etc.
Permalink	A user-friendly link which can be bookmarked or emailed and will not change between versions of AQUARIUS WebPortal
Person	A Person is added to the WebPortal for two reasons, receiving Notifications and Signing into the WebPortal. A Person who can Sign In is a User.
Primary Data Set	The Main Data Set at a Location for a given Parameter
Refresh	(See also Reset) Reloads the current set of Data in the Chart or Grid – the underlying data may have changed
Relative Date/Time	Date and Time specification relative to Now. Examples would be 5 minutes from now, 10 days ago, 1 year ago today.
Reset	(See also Refresh) Reset removes all Filters and sets the Sort Order back to its default for Grid
Report (Published Report)	A file published in AQUARIUS Time-Series which can be downloaded through the WebPortal
Script	(See Also SupaScript) Code written in the AQUARIUS SupaScript language that can extend functionality of the WebPortal and allow for complex rules to be written up

Section	(See also - tab) The three main components of the WebPortal interface, the Data Section, the Admin Section and the Account Section
Security Role	A set of permissions assigned to a User giving them access to certain tabs and certain CRUD operations within the Admin Section
Sign In	Entering the WebPortal as a named-User with an Account
SMS	Short Message Service – A text-based message sent via a mobile phone network
Social Sign In	(See also Forms Authentication, Windows Authentication) Signing Into the WebPortal by using a pre-existing account, either a Social Media account or corporate Google/Microsoft account
State	A State is something calculated against a Time-Series or Location which can then be combined with a Legend to classify data
State Calculation	A process used to automatically have States calculated against Time-Series and Locations, this involves use of a Script
Statistic Value	A value derived from performing a computation over a Time-Series
Statistic Definition	A definition used to set a calculation used to process and calculate Statistic Values against a Time-Series
Statistic Summary	A way of creating a user-friendly summarisation of Statistic Values into meaningful information
SupaScript (AQUARIUS SupaScript)	A programming language used to write Scripts in AQUARIUS WebPortal and Models in AQUARIUS Forecast
Synced	Data that has been copied in from AQUARIUS Time-Series and is kept up-to-date
System Administrator	The IT support staff who install and maintain the system – but don't have access to it
Tab	(See also - Section) – Screen displayed after clicking a navigation link in the left-side panel. Tabs are found within Sections.
Tab Group	Collapsible menu groupings of tabs in the Admin Section

Time-Series	A sequence of stored measurements over a period of time from AQUARIUS Time-Series
Unit	System used to measure the Time-Series data in AQUARIUS Time-Series
Unit Group	Group of Units that are measuring something common within a different system (e.g. metres and feet). Units within a Group can all be converted to one another.
UTC	Coordinated Universal Time – Common Time Standard used across the world
User	(Sub-set of a Person) A User is a Person who can sign in to the WebPortal. They do so by having an Account.
User Local Time	(See also – Data Local Time/UTC) – The time on the machine of the User viewing the WebPortal
View Group	Used to apply Settings and Security to groups of User Accounts
Widget	A small application which appears on a Dashboard. Widgets can display text, HTML, Charts, Tables, Gauges and anything else defined by the user.
Widget Template	A Template that defines the Layout and inputs of a Widget. Each Widget uses a Widget Template, and many Widgets can be made from a single Widget Template.
Windows Authentication	(See also Forms Authentication, Social Sign In) Signing into the WebPortal using the details of the user currently signed into Windows
Zone	(See also Easting, Northing) – The Zone is the area on a Grid of the Earth where Easting and Northing coordinates apply

Table 1: Glossary of Terms

2 Data Section

The main AQUARIUS WebPortal user interface is the Data Section. The Data Section includes a number of selectable tabs on the left-side and Data Context selectors at the top of the page as shown in Figure 1 below.

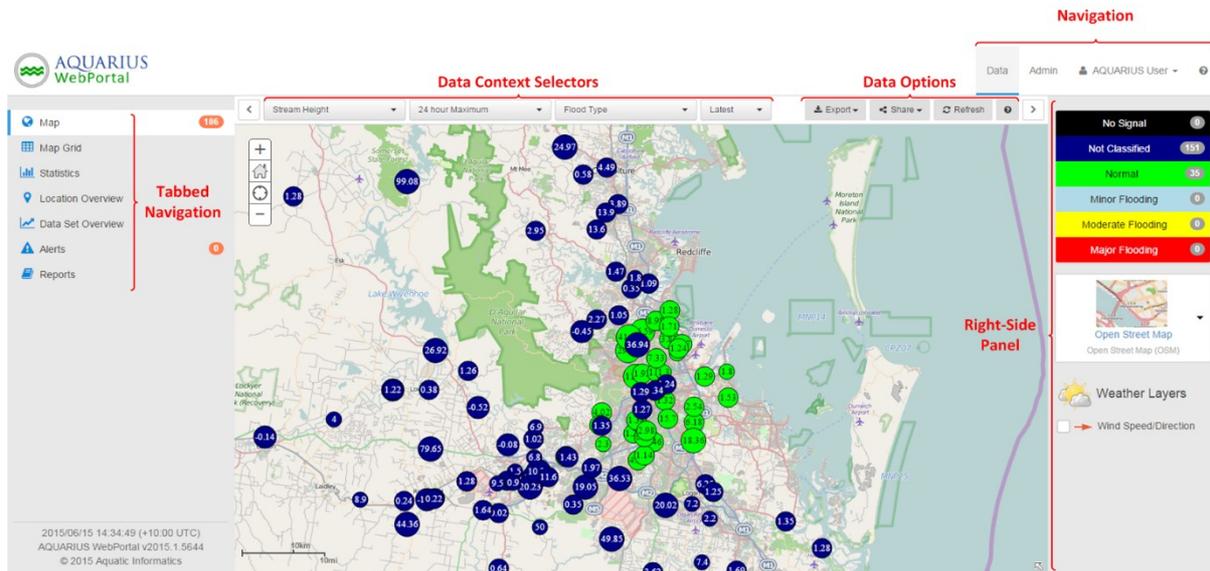


Figure 1: Data Section Controls

Each of the Data Section tabs are described below after the Data Section Overview, which describes how to use the Data Section, its tabs and all other features highlighted in Figure 1.

2.1 Data Section Overview

The Data Context Selectors and Tabbed Pages for the Data Section are described in detail in the following sections.

2.1.1 Navigation

The Navigation menu contains links to navigate between the Data Section, Admin Section and Account Section. There is also a Help Button which navigates into the Help Manual.

Users who aren't Signed In will see a link to the Data Section and a Sign In link.

Users who are Signed In will see a link to the Data Section, Admin Section (if they have a Security Role) as well as their own name. Clicking their name will show the Account Menu which navigates to tabs within the Account Section and includes a Sign Out link.

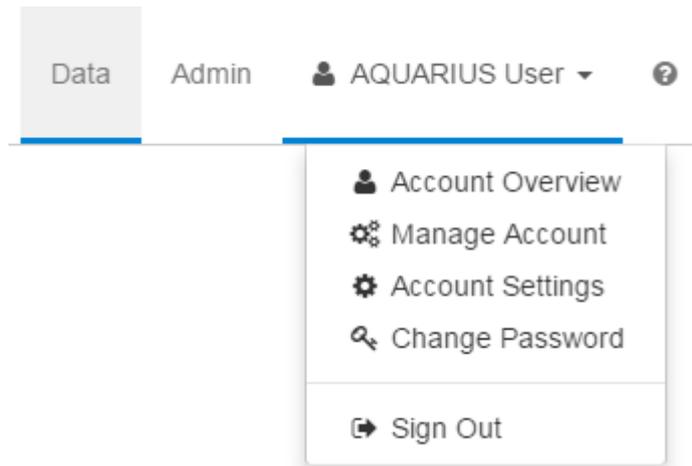


Figure 2: Navigation with Admin Section

2.1.2 Tabbed Navigation

From the left-side panel of the Data Section, the following list of tabbed pages is available:

- **Dashboards** (*Displays widgets including charts, tables, videos and gauges*)
- **Map** (*Interactive map with overlaid Location indicators*)
- **Map Grid** (*Grid-based view of the data from the Map tab*)
- **Statistics** (*Grid-based view of Statistics*)
- **Location Overview** (*Location Data and list of Data Sets on a per-Location basis*)
- **Data Set Overview** (*Summary, Charts, Grids and Statistics on a per-Data Set basis*)
- **Charts** (*Saved Charts with one or more Time-Series*)
- **Alerts** (*Summary of the currently triggered Alerts*)
- **Reports** (*Information Requests and Published Reports*)

The Map and Alert tabs have indicators displaying the number of Data Points displaying on the map and the number of currently triggered Alerts respectively.

The Current Version, Time and Time Zone and Copyright information are listed in the bottom left corner.

The Navigation can be made smaller by clicking the arrow button.



Figure 3: Navigation Hide/Expand Button

When minimised the navigation still displays, taking up less screen space.

2.1.3 Data Context Selectors

The Data Context selectors allow switching between various Parameters, Statistics, Legends, Intervals and Dates.



Figure 4: Data Context Selectors

The Data Context selectors are drop-down menus of items. Most of these menus can be searched or filtered by typing in the search box. Currently selected items will have a tick displayed next to them.

1. **Parameters:** The Parameter selector is used to choose which Data Sets are displayed on-screen. Parameters can be searched by typing in the search box.
2. **Statistic:** The Statistic selector is used to select what Statistic values are displayed on-screen. The list of Statistics available is based on the currently selected Parameters and Interval. Where Parameters have been selected with no common Statistics, the Statistic list will appear empty.

Selecting 'None' will display no data on-screen.

3. **Interval:** The Interval selector allows the user to select the timeframe of the displayed data. Selecting a value of Daily, Monthly or Yearly allows the user to select the desired Interval of periodic data. Selecting the Latest option will show the most recent data received. The period of the Latest data is defined by each Statistic.
4. **Date:** The Date selector is displayed when any option other than Latest is chosen in the Interval selector. It allows the Day, Month or Year to be selected directly from a calendar.

The Date selector also includes buttons for moving to the previous or next period based on the current selection (e.g. next day for Daily, next year for Yearly).

When Custom has been set as the Interval a date range of any period can be selected directly from two calendars.

NOTE: From version 2015.2 the Legend selector will be found in the Right-Side panel instead of with the Data Context Selectors.

2.1.4 Options Menu

The Options Menu allow for exporting, sharing and refreshing of data, as well as entering the help menu.

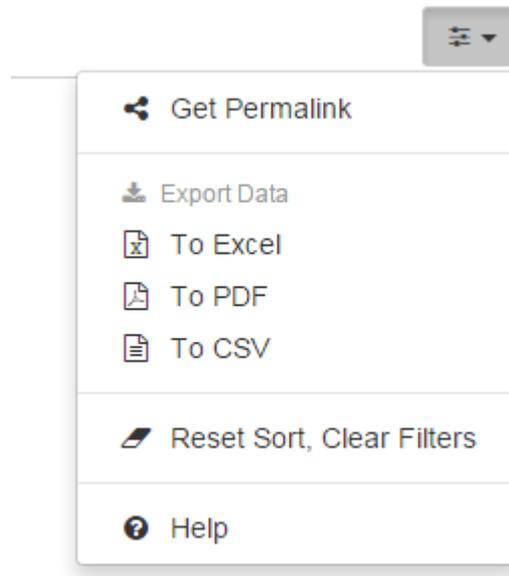


Figure 5: Options Menu

1. **Get Permalink** This displays the Permalink URL (Permanent Link) for the tab currently being viewed. This link can be copied and used to send to people in emails or bookmarked in a browser to get straight back to a favourite section. Permalinks can also be typed manually, for more information on how Permalinks are formed see section 8.11 for details.
2. **Export:** The export section contains options on how the data can be exported. Data presented in Grids can be exported into Excel, PDF and CSV formats. Charts can have their underlying data exported into these same formats as well as being exported themselves as a PNG or JPG image or PDF with an image.
3. **Reset Sort, Clear Filters:** This button is found on tabs with a Grid. It is used to Reset the Sort order and Clear the Filters of the Grid. This Resets the Grid back to its default view. More information on Grids is found in section 2.1.5.
4. **Refresh:** The Refresh button is found on tabs without a Grid that include data (such as the map). The button is used to refresh the underlying data which may have changed since it was loaded. For example when viewing data on the Map in the Latest Interval, the Refresh button would get any new data that has come through via telemetry.
5. **Help:** The Help button is found on all tabs in the controls menu. This help button is the contextual help button, it navigates directly to the correct section of the help manual based on the current section or tab being display in the WebPortal. There is a second help button in the main navigation menu, this opens the same help manual but opens it directly at the top of the document.

2.1.5 Right-Side Panel

The Right-Side Panel displays contextual information and additional display options for the tab currently being viewed.

The right-side panel is found in the Map, Map Grid, Data Set Overview, Charts and Reports tab. Examples of its use include on the Map tab where it has interactive options available only on the maps while the Charts within the Data Set Overview tab has interactive features only available on charts.

The right-side panel can be hidden at any point by clicking the arrow button. This is useful for gaining more space to display the Map or Chart.

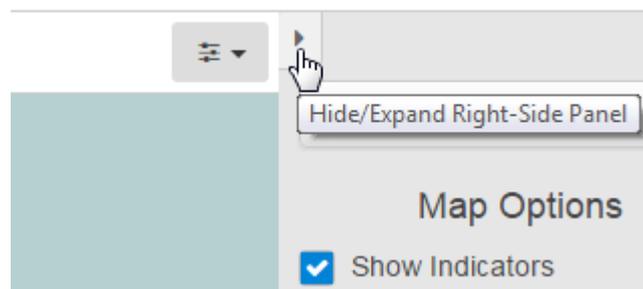


Figure 6: Right-Side Panel Hide/Expand Button

The Legend selector is displayed in the Right-Side Panel when the Map or Map Grid tabs are selected. The Legend Selector is used to classify the Statistic value being displayed for a given Data Set. The list of Legends is based on the currently selected Statistic and Interval. Selecting 'None' will display data on-screen unclassified by any Legend.

2.1.6 Grids

Grids (not shown in Figure 1) are enhanced tables in the WebPortal that include additional options for sorting of data, filtering, exporting, refreshing and navigation.

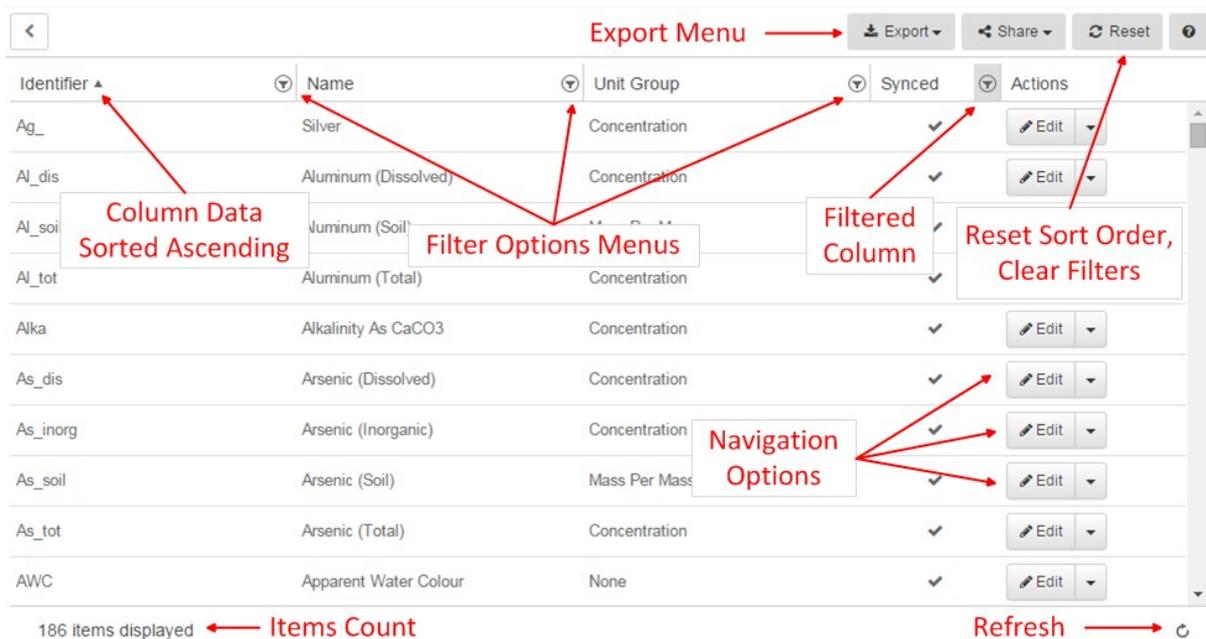


Figure 7: Grid Options

- Sorting:** A single column of data can be sorted by clicking anywhere in the column header. This will set the sort of the column to Ascending, then Descending then No Sort.
 Identifying where the data is sorted is done by looking for an arrow against the column name, which is used to indicate the sort direction.
- Filtering:** Multiple columns of data can be filtered (searched) to get a subset. Filtering can be done by clicking the filter icon in the column header, this will bring up the Filter options menu.
 Columns with current filters on them can be identified by looking for the Filter icon with a grey background.
- Export:** All Grid data can be exported into Excel, PDF and CSV formats from the Export button menu. When exporting data it will be exported with the current sort settings and filters in place, the data should therefore appear exactly as it is in the WebPortal.
- Reset:** By default, a Grid will have no filters applied and will be sorted by a single column. After filters have been applied and the sort order has been changed, the Reset button can be used to easily switch back to this default. It works by clearing all filters and setting the column sort back to its default.
- Items Count:** Grids display all items on a single page (without the need for pagination). The total number of items in the Grid can be found in the bottom left corner.
- Refresh:** When looking at data in the Latest Interval the underlying data can be refreshed by pressing the Refresh button in the bottom right corner.

7. **Navigation Options:** Navigation options, where available, are found in the last column. In the Admin section all Grids have an Actions column which contains navigation.

The button in the Actions column is for the most commonly performed action (usually “Edit”). The smaller button with an arrow includes a menu with additional options. These menus can be found broken-up in up to three different sections:

- a. The first section is for actions to View data or Navigate somewhere without altering data. (Example: navigate to location on map)
- b. The second section include options that change the data. (Examples: edit, clone, activate/deactivate, etc.)
- c. The third section includes the Delete option which cannot be undone.

Different menu options will be available depending on the item being viewed.

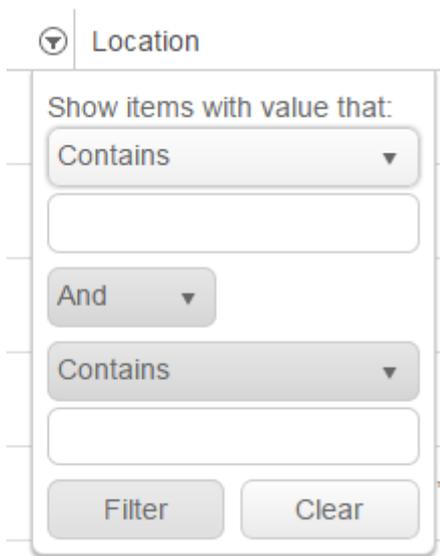


Figure 8: Grid Filter Menu

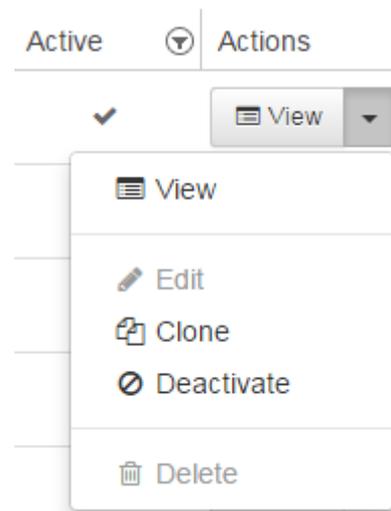


Figure 9: Grid Navigation menu example

2.2 Dashboards

Dashboards are used to display a series of Widgets, allowing a quick overview of data in the WebPortal. Dashboards are created and configured by an Administrator, and appear as a list under the Dashboards tab. Where only one dashboard exists the Dashboards tab will be replaced by a tab with the same name as that Dashboard. The Dashboards tab will be hidden when no dashboards are defined.

Dashboard Widgets that can be used include Free Text, Charts, Grids, Info Requests and Webcams. Widgets can also display external content, including websites, YouTube videos and Twitter Timelines.

Widgets can also have a user input. Some widgets will have drop-down menus or text fields, allowing the user to enter data. Examples of user data include plain text, selecting a Data Set, a Location, a Chart or a Script.

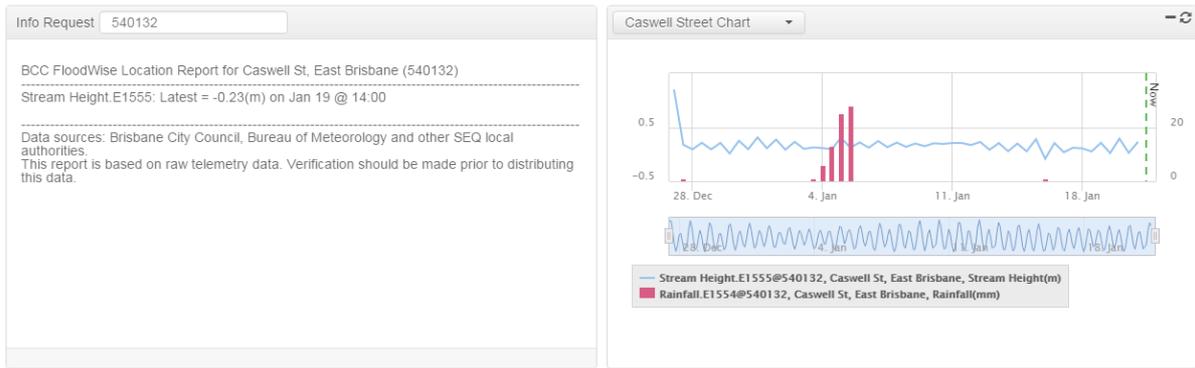


Figure 10: Widgets with Inputs

2.3 Map

The Map tab can be used to monitor latest values received via data acquisition/telemetry as well as review Historic events and Forecast data. Users have the option to display the Latest, Daily, Monthly or Yearly data on the map. For numbers to show up in the indicators, there must be Statistics Definitions available for each Parameter selected, see 2.1.3 on Data Context Selectors for more information.

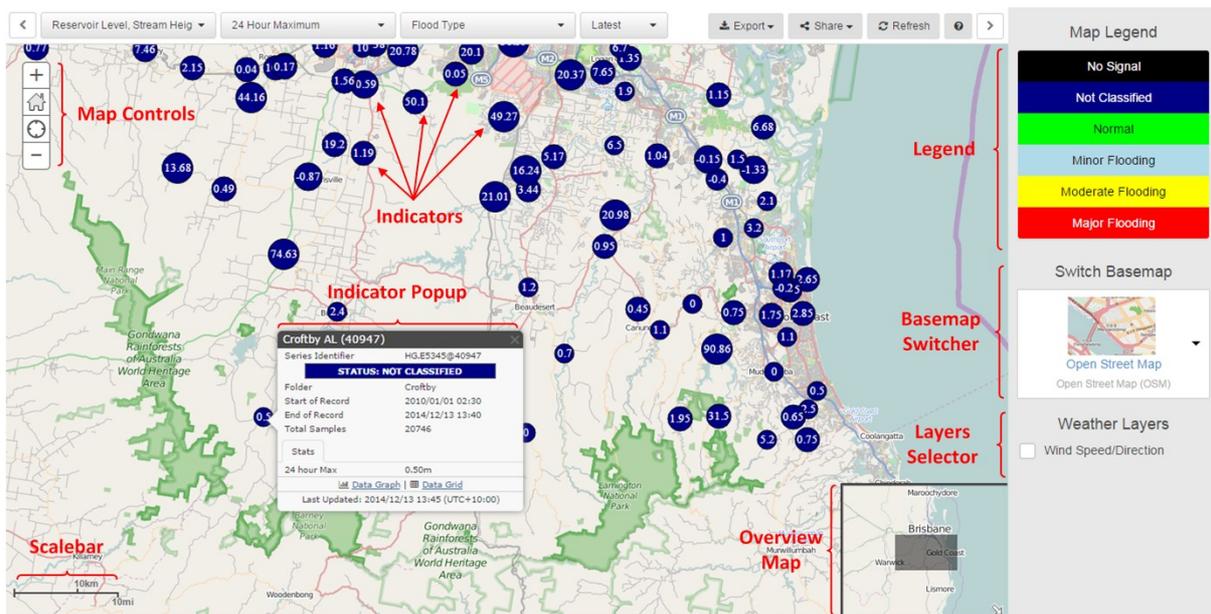


Figure 11: Map Features and Controls

The map is fully interactive, it can be moved in all four directions by holding down the mouse button and dragging and zooming in and out can be done with the mouse scroll wheel. For mobile devices, pinch and zoom works as well as panning. Other interactive Map elements are described in Table 2.

Map Features and Controls	
Map Controls	<p>Top-left corner, shows map movement options. The Home button will move the map to a predefined central location and the Geo-Locate button will find the User's current location on the map.</p> <div style="display: flex; align-items: center; margin-top: 10px;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;"> <div style="text-align: center; margin-bottom: 5px;">+</div> <div style="text-align: center; margin-bottom: 5px;">🏠</div> <div style="text-align: center; margin-bottom: 5px;">📍</div> <div style="text-align: center; margin-bottom: 5px;">-</div> </div> <div> <p>Zoom In button</p> <p>Home button</p> <p>Geo-Locate button</p> <p>Zoom Out button</p> </div> </div>
Scale Bar	Bottom-Left corner, shows a Scale in Metric/Imperial
Overview Map	<p>Bottom-Right corner, an arrow is displayed that one can click which will open up a smaller Overview Map. The grey box in the Overview Map is the current extent shown on the main map.</p> 
Legend	Right-Side Panel, shows the Legend that classifies the data currently displayed on the Map.
Map Options	<p>Right-Side Panel, shows checkboxes which change how data is displayed on the Map.</p> <ul style="list-style-type: none"> • Show Indicators <ul style="list-style-type: none"> ○ Shows or Hides all Indicators representing Locations or Time-Series • Show Values in Indicators <ul style="list-style-type: none"> ○ Shows or Hides numbers that are shown in Indicators. Hiding numbers means all Indicators will be the same size (but still be coloured according to their Legend) • Primary Data Sets Only <ul style="list-style-type: none"> ○ Shows only a single Data Set for a specific Parameter where a Primary Data Set has been specified. This can stop overlapping of Indicators on the Map. • Show Blacklisted Data Sets <ul style="list-style-type: none"> ○ Shows or Hides the Blacklisted Data Sets. Where a Data Set has been Blacklisted, the values may be incorrect, so the Indicators can be removed from the Map.
Basemap Switcher	Right-Side Panel, options for what is being used as the underlying Map. Includes Satellite Imagery and World Terrain maps among others.
Data Set References	Right-Side Panel, shows a list of Data Set References which can be overlaid on the Map as new Indicator layers.
Heat Maps and Isolines	Right-Side Panel, shows a list of Heat Maps and Isolines that can be overlaid on the Map as a layer.
Layers Selector	Right-Side Panel, allows layers to be overlaid on the map by switching

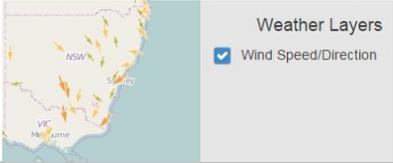
	<p>them on. Example available is Wind Speed/Direction which overlays coloured arrows onto the map.</p> 
Indicators	<p>Symbols on the Map which indicator Locations and Data Sets. When a Statistic is selected they will usually include a number. When a Legend is selected they will be evaluated and coloured according to that Legend. The number of indicators on the map is displayed in the navigation panel in orange (183 in this example).</p> 
Popup (Indicator Popup)	<p>Hovering over any of the indicators will display contextual information. Configurable data such as Statistic Summaries and Parameter Ranges are shown along with standard information like the Start and End of Record. Each popup will also display a link to switch to the Location Overview and Data Set Overview.</p>

Table 2: Map Interactive Elements

2.4 Map Grid

The Map Grid tab gives a grid-based view of the same data currently being displayed on the map. The selections available are the same, Parameters, Statistic, Legend and Interval. The value of the Statistic appears in the Statistic column (as it would appear within the map indicator) and the classification of the Statistic (as per the legend) is displayed in the Classification column. The grid allows for ordering and filtering of each column.

Data Set Id	Location	Location Folder	Start of Record	End of Record	Statistic Value	Classification	Go To
HG Gage Height@0188630	Green River at Warren Bridge near Daniel, WY (0188630)	All Locations > Division 4 > District 11	2014/03/06 09:00	2014/09/25 12:45	2.04	Minor Flooding	Go To
HG Gage Height@05657000	North Platte River below Whelan Diversion Dam (05657000)	All Locations > Division 1 > District 14	2009/07/07 13:15	2014/09/25 13:00	6.32	Minor Flooding	Go To
HG Gage Height@042423200	Belle Fourche River near Aixa (042423200)	All Locations > Division 2 > District 07	2009/07/07 13:00	2014/09/25 12:45	1.67	Minor Flooding	Go To
HG Gage Height@06323000	Priney Cr @ Kearney, WY (06323000)	All Locations > Division 2 > District 11	2009/07/07 07:00	2014/09/25 12:45	1.36	Minor Flooding	Go To
HG Gage Height@0306NM04	Nowood River near Manderson, WY (0306NM04)	All Locations > Division 3 > District 06	2011/06/07 07:45	2014/09/25 12:30	3.31	Normal	Go To
HG Gage Height@0306NM01	Nowood River near Ten Sleep, WY (0306NM01)	All Locations > Division 3 > District 06	2011/07/07 04:45	2014/09/25 12:30	1.33	Normal	Go To
HG Gage Height@03050036	Del Creek above McManus Ditch near Thermopsis, WY (03050036)	All Locations > Division 3 > District 05	2012/03/31 12:30	2014/09/25 12:30	1.03	Normal	Go To
HG Gage Height@03050033	Del Creek at Aquilino Ranch Bridge (03050033)	All Locations > Division 3 > District 05	2009/06/06 00:45	2014/09/25 12:30	1.8	Normal	Go To
HG Gage Height@0303WR09	Johnston Ditch at Headworks, near Kinross, WY (0303WR09)	All Locations > Division 3 > District 03	2012/04/06 13:15	2014/09/25 12:30	1.65	Normal	Go To
HG Gage Height@0303WR23	LaClair Canal at 789 Check (0303WR23)	All Locations > Division 3 > District 03	2014/05/26 11:45	2014/09/25 12:30	0.91	Normal	Go To
HG Gage Height@0303WR07	Leifhard Ditch at Headworks near Riverton (0303WR07)	All Locations > Division 3 > District 03	2012/03/24 14:45	2014/09/25 12:30	1.6	Normal	Go To
HG Gage Height@0301PA02	Little Pope Age River near Lander, WY (0301PA02)	All Locations > Division 3 > District 01	2002/10/01 23:00	2014/09/25 12:30	2.51	Normal	Go To
HG Gage Height@014AR3SC	Whitford Reservoir No. 3 Supply Canal (014AR3SC)	All Locations > Division 1 > District 04A	2013/04/04 10:00	2014/09/25 12:30	0.99	Normal	Go To
HG Gage Height@0102HP0	Haskellings Reservoir Outflow (0102HP0)	All Locations > Division 1 > District 02	2011/08/02 07:45	2014/09/25 12:30	0.33	Normal	Go To
HG Gage Height@0102HRCK	Home Creek at Goshen-Laramie CO Line (0102HRCK)	All Locations > Division 1 > District 02	2013/11/22 11:45	2014/09/25 12:30	2.31	Normal	Go To
HG Gage Height@0205490	North Piney Creek above Apperson Creek (0205490)	All Locations > Division 4 > District 10	2012/06/03 07:30	2014/09/25 06:16	1.56	Normal	Go To
HG Gage Height@13015000	Geis Ventre River at Zurich near Jackson, WY (13015000)	All Locations > Division 4 > District 16	2014/03/18 07:30	2014/09/25 12:15	17.45	Normal	Go To

Figure 12: Map Grid showing Locations, Data Sets and Statistics

2.5 Location Overview

The Location Overview tab displays data about Locations as well as listing the related Data Sets for further navigation. The Go To button against each of the Data Sets allows easy navigation to the Data Set Overview Summary, Chart, Grid and Statistics.

Location: 40761

Location Name	Wolffdene AL
Location Type	Measurement
Folder	Wolffdene
Latitude	-27.78278°
Longitude	153.18889°
Elevation	0 m
Time Zone	UTC+10:00

Data Sets

Data Set Id	Parameter	Start of Record	End of Record	Last Updated	Active	Go To
Precip.E6234@40761	Rainfall	2010/03/12 14:20:00	2015/06/01 12:25:00	2015/06/01 12:26:00	✓	Go To
Stage.E6235@40761	Stream Height	2010/01/03 14:35:00	2015/06/01 02:30:00	2015/06/01 02:47:24		Go To

- Data Set Overview
- Summary
- Chart
- Grid
- Statistics

2 items displayed

Figure 13: Location Overview Tab

2.6 Data Set Overview

The Data Set Overview tab displays all information for a Data Set. The Information is broken up into sub-tabs of Summary, Chart, Grid and Statistics.

2.6.1 Summary

The Data Set Overview Summary tab displays a summary of information about the Data Set, this include the Parameter and Unit, Start and End of Record amongst other information. This standard information is also shown in the right-side panel.

If the Data Set has Parameter Ranges defined these will also be displayed. Examples could include Dam Spill Levels, Environmental Compliance Bands, Licence Limits, Flooding Levels, etc.

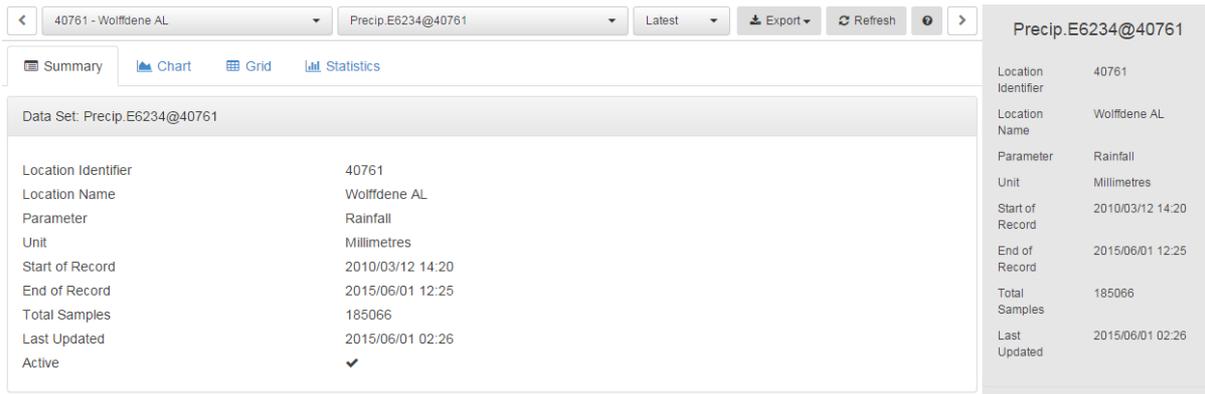


Figure 14: Data Set Overview - Summary

2.6.2 Chart

The Chart tab displays the Data Set Time-Series data plotted onto a Chart. Where the Interval is set to Latest, the chart will display 24 hours into the past and 6 hours into the future by default, with a dashed line indicating “Now”. This time period can be changed by switching the Interval and setting the date. Underneath the plot area the Grade Code bar will be displayed to indicate the quality of the Time Series data.

All charts allow the user to zoom and set the x-axis. The navigation bar below the chart allows the start and end times of the current chart to be set. The start and end times can also be set by clicking and dragging from the desired start to the desired end on the chart area.

The right-side includes the Chart Options allowing Resetting of the Zoom, switching Time Zones and switching from Pan and Zoom modes. The right-side panel also allows configured bands, lines and markers to be overlaid on the chart (if available), as well as the Grade Code legend, and the Chart Options.

The Chart Options button will launch a modal allowing the user to modify the Chart Display, add additional Data Sets, Process the data and modify the Chart Axes. Administrators have the option to save Charts from this menu so that they appear on the main Chart tab. More information on Charts can be found in section 2.7.

Hovering over the chart without clicking, will display the value at that particular location and the time it occurred.

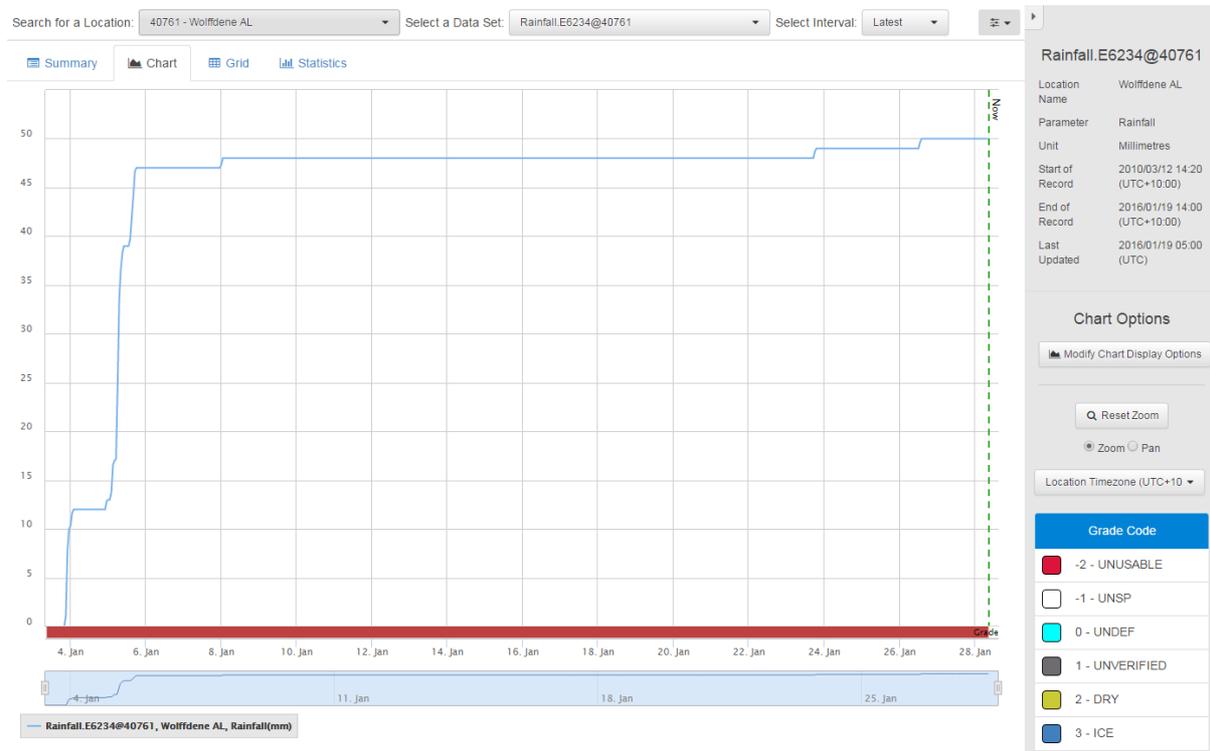


Figure 15: Data Set Overview - Chart

2.6.3 Grid

The Grid tab shows the same Time-Series data from the chart displayed in tabular format. As well as displaying the Time and Value the Grid displays the other important information from the Time-Series, the Grade Code and Interpolation Type.

Time	Rainfall (millimetres)	Grade Code	Interpolation Type
2015/05/01 22:05:00	1	61 - A-EXCELLENT	6 - Inst. Totals
2015/05/01 20:35:00	4	61 - A-EXCELLENT	6 - Inst. Totals
2015/05/01 19:45:00	1	61 - A-EXCELLENT	6 - Inst. Totals
2015/05/01 19:40:00	1	61 - A-EXCELLENT	6 - Inst. Totals
2015/05/01 19:35:00	3	61 - A-EXCELLENT	6 - Inst. Totals
2015/05/01 19:30:00	3	61 - A-EXCELLENT	6 - Inst. Totals
2015/05/01 19:20:00	2	61 - A-EXCELLENT	6 - Inst. Totals
2015/05/01 19:15:00	4	61 - A-EXCELLENT	6 - Inst. Totals
2015/05/01 19:00:00	1	61 - A-EXCELLENT	6 - Inst. Totals
2015/05/01 18:55:00	1	61 - A-EXCELLENT	6 - Inst. Totals
2015/05/01 18:45:00	1	61 - A-EXCELLENT	6 - Inst. Totals
2015/05/01 18:25:00	1	61 - A-EXCELLENT	6 - Inst. Totals
2015/05/01 18:15:00	1	61 - A-EXCELLENT	6 - Inst. Totals
2015/05/01 18:10:00	2	61 - A-EXCELLENT	6 - Inst. Totals

79 items displayed

Precip.E6234@40761	
Location Identifier	40761
Location Name	Wolfdene AL
Parameter	Rainfall
Unit	Millimetres
Start of Record	2010/03/12 14:20
End of Record	2015/06/01 12:25
Total Samples	185066
Last Updated	2015/06/01 02:26

Figure 16: Data Set Overview - Grid

2.6.4 Statistics

The Statistics tab displays all Statistics calculated for the Data Set for the current Interval. The example Figure 17 shows nine different Statistics that have been calculated for Rainfall data. Statistics are pre-calculated for the defined Intervals and are therefore not available against the Custom Interval.

Statistic	Timestamp	Statistic Value	Grade Code	Interpolation Type
Heaviest 15 min	2015/05/02 00:00:00	18	10 - EST POOR	3 - Preceding Max.
Heaviest 30 min	2015/05/02 00:00:00	29	10 - EST POOR	3 - Preceding Max.
Heaviest 1 hr	2015/05/02 00:00:00	45	10 - EST POOR	3 - Preceding Max.
Heaviest 2 hr	2015/05/02 00:00:00	75	10 - EST POOR	3 - Preceding Max.
Heaviest 3 hr	2015/05/02 00:00:00	93	10 - EST POOR	3 - Preceding Max.
Heaviest 6 hr	2015/05/02 00:00:00	157	10 - EST POOR	3 - Preceding Max.
Heaviest 12 hr	2015/05/02 00:00:00	175	10 - EST POOR	3 - Preceding Max.
Heaviest 18 hr	2015/05/02 00:00:00	185	10 - EST POOR	3 - Preceding Max.
Total	2015/05/02 00:00:00	195	1 - UNVERIFIED	5 - Preceding Totals

9 items displayed

Precip.E6234@40761	
Location Identifier	40761
Location Name	Wolfdene AL
Parameter	Rainfall
Unit	Millimetres
Start of Record	2010/03/12 14:20
End of Record	2015/06/01 12:25
Total Samples	185066
Last Updated	2015/06/01 02:26

Figure 17: Data Set Overview - Statistics

2.7 Charts

NOTE: From version 2015.2 the Charts tab will replace the Composite Charts tab found in previous versions. Existing composite charts will not be carried across to 2015.2, however any existing data used for the composite charts will still exist in the Global Settings.

The Charts tab displays Time-Series charts that have been configured in AQUARIUS WebPortal. Charts can be created from the Chart section of the Data Set Overview, or from the Charts tab. Any user with access to the Charts tab can view and modify existing charts, however only Administrators can save and delete charts. Saved charts can be viewed from the Charts drop-down menu.

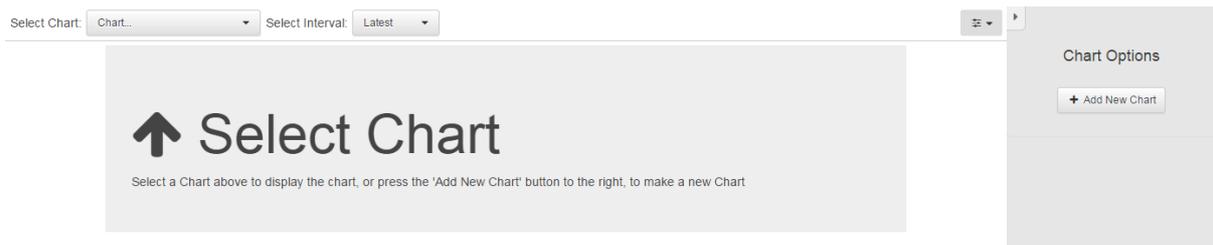


Figure 18: Chart Screen

The Chart Form allows the user to modify the Data Sets displayed, the Axes used and several other chart settings. The Chart Form can be launched from the Right-Side panel. Pressing the 'Add New Chart' button will launch a new form. If a chart is already displayed it can be modified by pressing the 'Modify Chart Display Options' button.

The Data Sets tab displays the existing Data Sets in the charts, and allows the user to add more. Each Data Set must have a Location and Time-Series associated with it to display on the chart. The Series Type and axis can be selected for each Data Set.

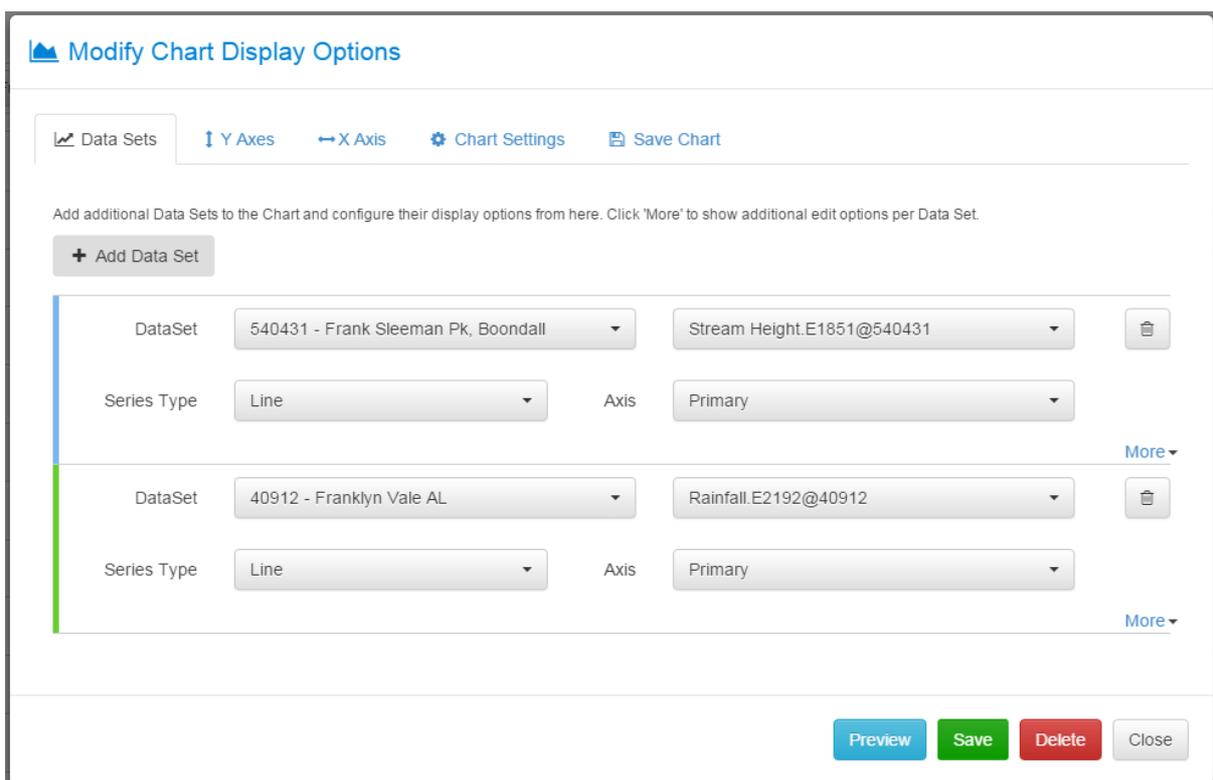


Figure 19: Chart Display Options Form

Where more customisation is required, additional settings can be viewed by pressing the 'More' button at the bottom right of each Data Set in the list. These setting allow the user to

change the line and marker settings, change the Legend and Tooltip Types, and add Processes to the Time-Series data.

Legend and Tooltip Types can be set to 'Full', 'Brief' or 'Custom'. 'Full' will display the Identifier, Location, Parameter and Unit of the Data Set. 'Brief' will only display the Code, and 'Custom' will display the text entered into the 'Legend Text' or 'Tooltip Text' boxes.

The screenshot shows a configuration form for chart display options. It includes the following elements:

- DataSet:** 540431 - Frank Sleeman PK, Boondall
- Stream Height:** E1851@540431
- Series Type:** Line
- Axis:** Primary
- Line Colour:** Blue
- Line Type:** Solid
- Line Width:** 2
- Marker Colour:** Blue
- Marker Shape:** Circle
- Marker Size:** 0
- Processes:** (Empty text box)
- Legend Type:** Full
- Tooltip Type:** Brief
- Legend Text:** (Empty text box)
- Tooltip Text:** (Empty text box)

A 'Less' button is located at the bottom right of the form.

Figure 20: Chart Display Options Form - Additional Settings

Data Set Processes are defined to perform pre-processing of Time-Series data before it is used to display on a chart. Processes are an advanced user feature, and more information can be found in section 8.4. Multiple Y Axes can be added in the Y Axes tab. By default, two axes are created, representing the Left-Side axis and the Right-Side axis, called 'Primary' and 'Secondary' respectively. The axes can be titled by filling in the 'Title Text' fields. Additional settings can be viewed by pressing the 'More' button at the bottom right of each Axis in the list.

Modify Chart Display Options

Data Sets | Y Axes | X Axis | Chart Settings | Save Chart

Add additional Y Axes and configure their display options from here. Y Axes can be used to help display multiple Data Sets of different Parameters/Units together.

+ Add Axis

Axis Name: Primary | Title Text: | Position: Left |

Label Format: | Label Font Size: 11

Title Font Size: 12 | Axis Colour:

Grid Colour:

Logarithmic: No | Reverse: No

Less

Axis Name: Secondary | Title Text: | Position: Right |

More

Preview | Save | Delete | Close

Figure 21: Chart Display Options Form - Y Axes

2.8 Alerts

The Alerts tab displays a list of the currently triggered Alerts when Latest is selected as the Interval. For a Periodic Interval the grid displays a list of all Alerts triggered within that period.

Map 586 | < Latest | Export | Reset |

Name	Message	Triggered

Figure 22: Alerts Tab

2.9 Reports

The Reports section can be used to perform Information Requests and view custom reports published in AQUARIUS Time-Series.

Info Requests are text-based reports that are generated on-demand. They can be accessed through the WebPortal but are also available via email request and text message (SMS) request for remote access, see section 6 for more information.

A list of Info Requests is available in the Info Request selector at the top of the page. Selecting a new Info Request will automatically run the request and return a text-based output as displayed in the example Figure 23.

Some info requests require additional arguments to run, which are entered in the “Info Requests Arguments” box. Clicking the Run Info Request button will then send a request with the additional details provided.

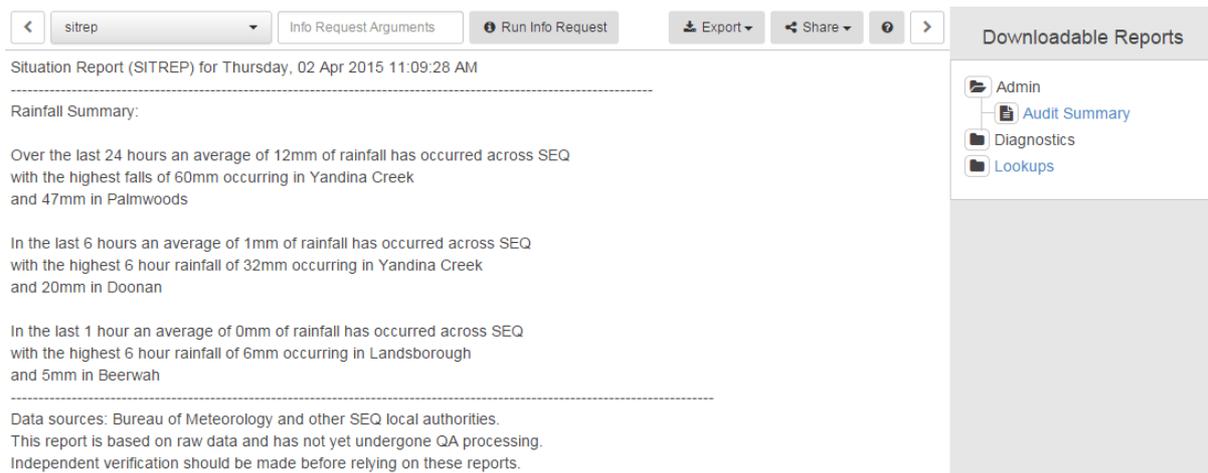


Figure 23: Info Requests and Downloadable Reports Tree View

Reports are displayed in the right-side panel in a tree hierarchy and can be downloaded by clicking them. Report files may be PDF files and will require a suitable application to read.

3 Account Section

The Account Section is used by Users to make changes to their own Account details. This section of the document also includes details about the various methods that can be used to Sign In and Out of AQUARIUS WebPortal.

3.1 Signing In

To Sign in to AQUARIUS WebPortal click the Sign In button in the top-right navigation menu. AQUARIUS WebPortal accounts are created by Administrators and assigned to users. If an account is required, contact an Administrator.

There are three different ways to Sign In to AQUARIUS WebPortal. The options are:

1. Windows Authentication
2. Social Media Sign In (Five potential options)
3. WebPortal Account (Username and Password)

NOTE: These options may not have been configured on the AQUARIUS WebPortal system currently being accessed.

The screenshot shows the 'Sign In' page with a help icon in the top right. It is divided into two main sections:

- Using Windows/Social Media:** A vertical stack of six buttons: 'Sign In with Windows Authentication' (blue), 'Sign In with Google' (red), 'Sign In with Facebook' (dark blue), 'Sign In with Twitter' (light blue), 'Sign In with Microsoft' (green), and 'Sign In with LinkedIn' (dark blue).
- Using AQUARIUS WebPortal account:** A form with a 'User name' input field (with a user icon), a 'Password' input field (with a lock icon), a green 'Sign In' button, a 'Remember me' checkbox, and a 'Forgotten password?' link.

Figure 24: Sign In Options

3.1.1 Windows Authentication

Windows Authentication is available to users on a local network. If the Windows usernames matches the AQUARIUS WebPortal username you can chose to Sign In with Windows Authentication. This passes through the current Windows User's credentials without requiring a password, automatically signing you in.

3.1.2 Social Media

Social Media allows you to link your AQUARIUS WebPortal account to a social media account, when you click the Sign In button, you will either be automatically Signed In, or you can use your social media account details to Sign In. This reduces the need to remember additional usernames and passwords.

NOTE: On first Sign In through a Social Media provider you will be required to accept an agreement to share information with the WebPortal. This is just related to your email address or username which we use to link accounts.

AQUARIUS WebPortal does not retrieve any additional information from your Social Media accounts.

3.1.3 WebPortal Account

Signing In to AQUARIUS WebPortal can also be done using a username and password. These details are stored in the WebPortal database and cannot be used elsewhere. This method of Signing In is not recommended, for ease of use we recommend using a Windows account or linking to a Social Media account to avoid having to remember a new username and password.

3.1.3.1 Forgotten Passwords

When a User has forgotten their AQUARIUS WebPortal account password, a temporary password can be set by pressing the “Forgotten password?” link. The user can then enter their username, and a new temporary password will be send via email or text message (SMS) (email and text message options are configured in section 4.7.1).

Password Reset ?

Please enter your username in the box below. An email and/or SMS will be sent to you with a temporary password.

User name 👤

Reset

Cancel

Figure 25: Forgotten Password

Once the user has received their new temporary password, they can sign in. A User signing in with a temporary password will be prompted to change their password.

If the User doesn't have an email address or mobile phone number configured, they will need to ask an Administrator to manually reset their password.

NOTE: Forgotten Password is only for AQUARIUS WebPortal accounts and doesn't apply to Windows Authentication or Social Media accounts.

3.2 Account Management

Once signed in, the User can navigate to the Account section by clicking on their name at the top right side of the screen and clicking 'Account Overview'.

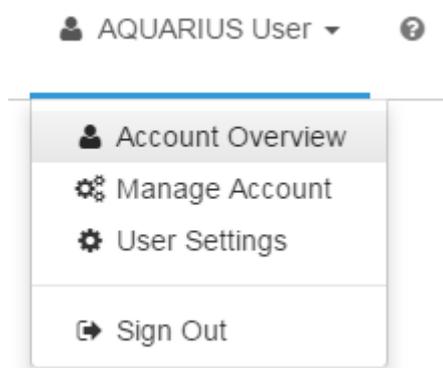


Figure 26: Account Overview

3.2.1 Account Overview

The Account Overview screen gives an overview of the account details, the account's Alerts, and links to manage the Account and change the password.

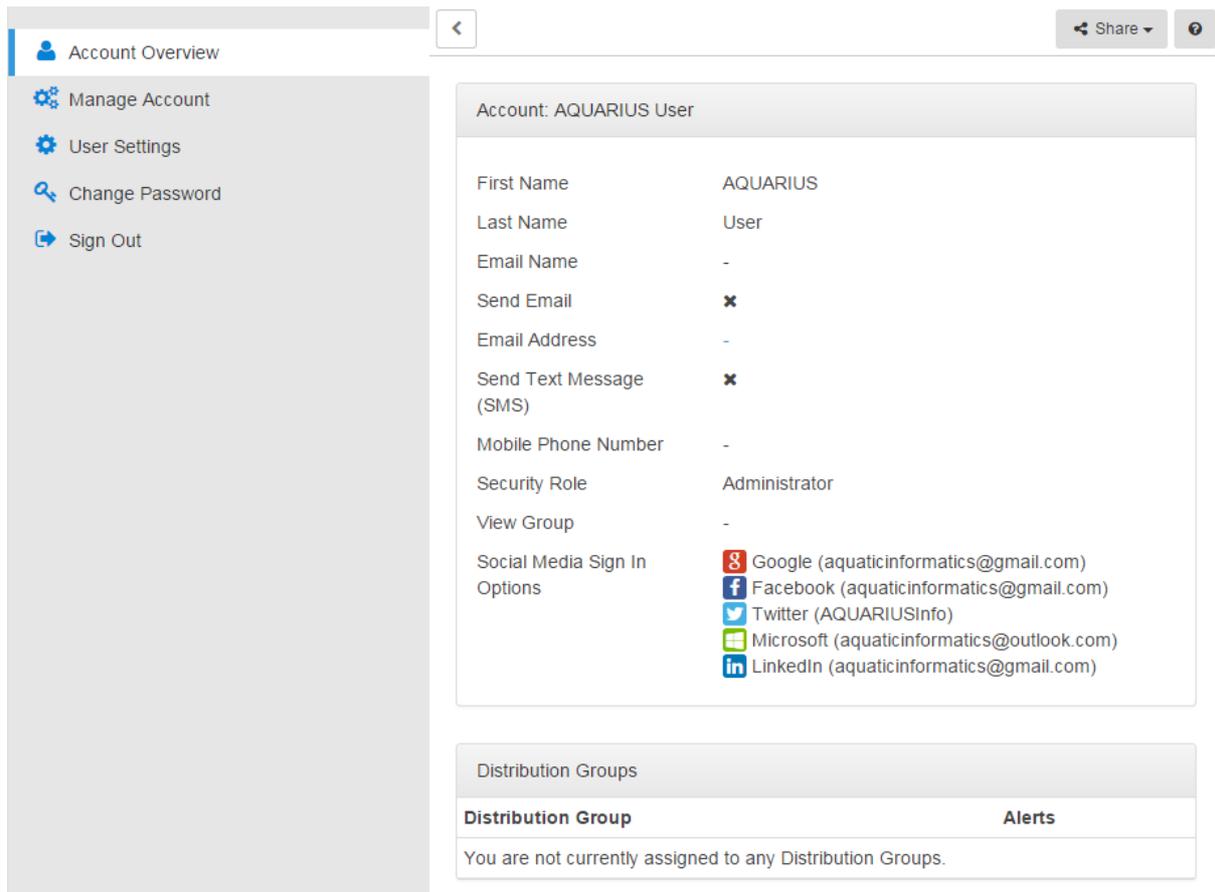


Figure 27: Account Overview screen

3.2.2 Manage Account

From the Account Section, a Person’s details can be edited by pressing the “Manage Account” button in the navigation menu.

The Manage Account screen allows the User to edit details such as their name, email address and language. The Notification settings can also be changed, allowing the User to receive Notifications at the specified email address or mobile phone number.

3.2.2.1 Linking Account to Social Media

A WebPortal account can be linked to a Social Media provider from the Manage Account screen. This allows Signing In using a Social Media account without needing a new username and password. There are five options for Social Media: Google, Facebook, Twitter, Microsoft and LinkedIn.

Click to link the account to one of the providers, for example Google. Details used for Sign In will need to be added. For Google/Facebook/Microsoft/LinkedIn this is an email address, for Twitter this is a Twitter Handle, without the @.

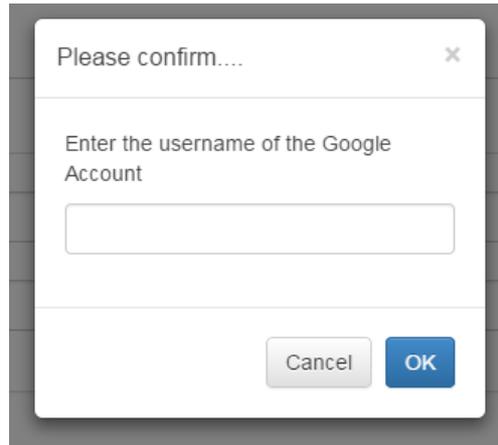


Figure 28: Linking Account to Google

The account is now linked, clicking the Sign In with Google option using the “aquaticinformatics@gmail.com” account will Sign In to the WebPortal automatically.

Social Media Sign In Options

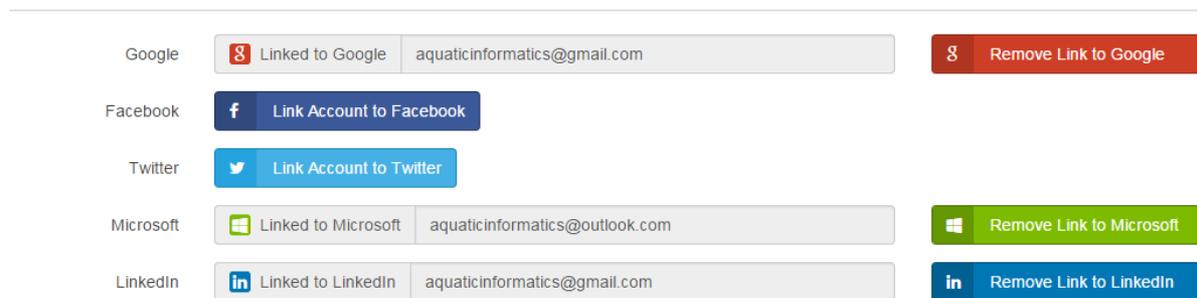


Figure 29: Associated Accounts

3.2.3 Account Settings

The Account Settings tab displays a list of uncollected settings for various parts of the system. This can display a mix of User, View Group and Global Settings. Any Global Setting which can be overridden will be visible in the Account Settings grid, unless it has been overridden by a User or View Group Setting. Likewise, View Group settings will be listed unless they have been overridden by an Account Setting. The View Group Settings will only be displayed if the User is assigned to a View Group.

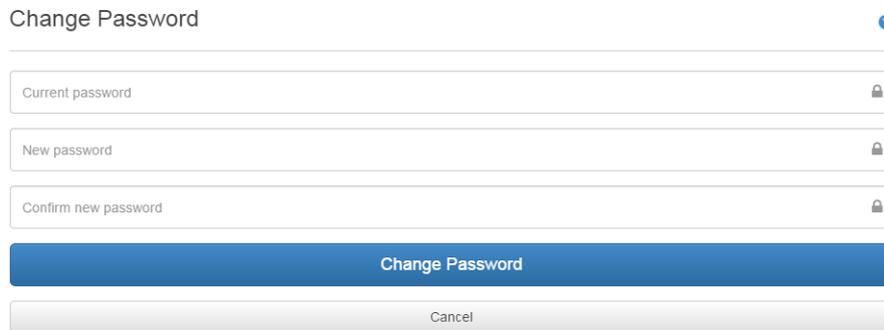
Users have the option to override Global and View Group Settings, or create, edit and delete Account Settings.

The Settings listed in the Account Settings tab are used when the User has Signed In.

For more information on the use of Settings, see section 4.9.1

3.2.4 Changing Passwords

The account password can be changed by pressing the “Change Password” button found in the top-left corner.



The image shows a 'Change Password' form. At the top left is the title 'Change Password' and a help icon. Below the title are three input fields: 'Current password', 'New password', and 'Confirm new password', each with a lock icon on the right. Below the input fields is a blue button labeled 'Change Password' and a grey button labeled 'Cancel'.

Figure 30: Change Password Screen

This screen is the same as that displayed when a temporary password is entered. The user can enter their current password and the new password to be used.

3.3 Signing Out

Sessions on AQUARIUS WebPortal will stay Signed In indefinitely while activity is being performed (e.g. switching between tabs and sections of the system). If AQUARIUS WebPortal is left for one hour it will automatically be Signed Out.

Users can also manually Sign Out of the WebPortal in two ways:

1. Through the Sign Out link in the Account Menu as in Figure 31:

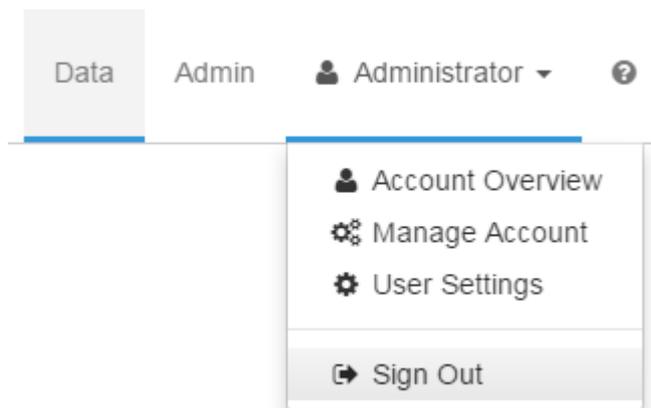


Figure 31: Sign Out – Account Menu

2. Through the link found in the tabbed navigation from the Account Section as in Figure 32:

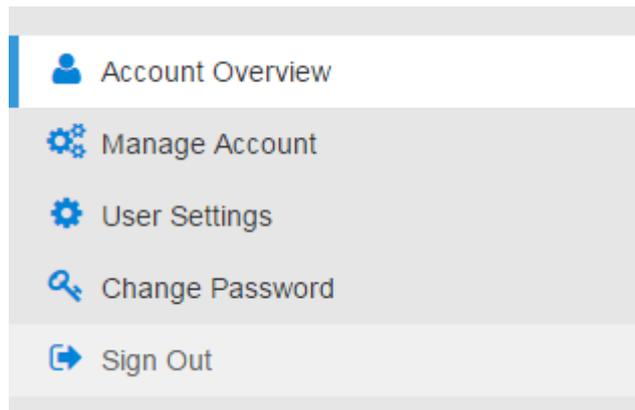


Figure 32: Sign Out – Account Tabbed Navigation Menu

NOTE: On AQUARIUS WebPortal systems that only use Windows Authentication, AQUARIUS WebPortal will Sign In automatically. Attempting to Sign Out will Sign you back in again. Sign Out is not required for Windows Authentication systems only.

4 Admin Section

The AQUARIUS WebPortal Admin section is a secure area of the system that can be accessed by Signed-In users who have been assigned a Security Role. The Admin section is further broken down into various tabs. Security Roles control which tabs users have access to.

The Admin section has a standard layout of tab groups in the left-side menu. Each tab group is a link which, when clicked, contains a drop-down list of tabs.

The Admin Section tab groups and tabs are as follows:

- **Locations and Folders** (*Locations, Location Types, Folders and Folder Types*)
- **Parameters and Units** (*Parameters, Parameter Range Definitions, Units, Unit Groups*)
- **Data Sets** (*Data Sets, Data Sets Blacklist, State Definitions*)
- **Statistics and Legends** (*Statistic Definitions, Statistic Summaries, Statistic Summary Groups, Legends, Legend Styles*)
- **Alerting and Notifications** (*Alerts, Alert Templates, Distribution Groups, Notifications*)
- **Scripts and Extensions** (*Scripts*)
- **Security** (*People, Security Roles, View Groups, Audit Logs*)
- **Global Settings**

Each tab will link to a standard grid layout with options as in the example below:

- Buttons in the controls menu (left-side) to Add New items
- Buttons in the controls menu (right-side) to Export all data to external files, get the Share Permalink, Reset the Grid (clearing filters and resetting the sorting orders) and Navigate to Contextual Help
- An Actions column as the right-most column of the grid with a single button for the most common action (mostly an Edit button) as well as drop-down menu for additional options (such as cloning, activating, deleting, etc.)



4.1 Locations and Folders

The Locations and Folders group allows the user to view Locations, Location Types, Folders and Folder Types that have been synchronised in from AQUARIUS Time-Series.

4.1.1 Locations

The Locations tab displays a list of Locations that have been synchronised in from AQUARIUS Time-Series.

Clicking “Overview” for a Location goes to another screen with more information about the particular Location. From here, Location details, Map and the Data Set list related to the Location can be viewed.

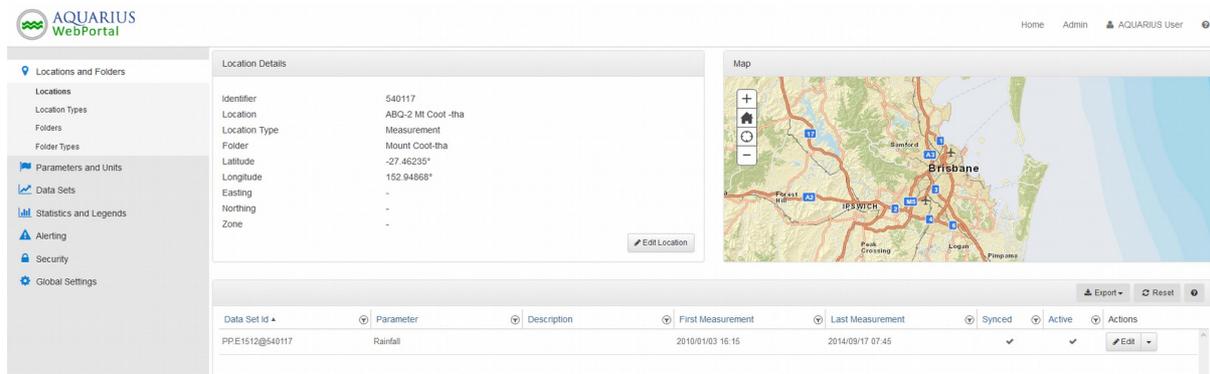


Figure 33: Location View screen

The top-left section displays summary information about the Location.

The top-right section displays a map that will centre itself on and display an indicator at the Location.

4.1.1.1 Data Sets

The Data Sets table contains a list of all Data Sets that are grouped under the current Location. Current Data Sets have additional options that can be found by pressing the down arrow next to the Edit button.

Setting a Data Set as Primary can be done from this list of Data Sets. For each Parameter you are able to have a single Primary Data Set, this can be the main Data Set displayed prominently on the Map. The Parameter column is displayed bold for the Primary Data Set of that Parameter type.

4.1.2 Location Types

Each Location is assigned a Location Type. The list of location types can be viewed in under the Location Type menu.

Pressing the Edit button will display the details of that location type.

Figure 34: Location Type Data Entry Form

The Location Type is synchronised in from AQUARIUS Time-Series and cannot be edited, however if there are any Parameter Range Definitions set for Location Types, the values can be set here.

4.1.3 Folders

The Folders tab lists Folders that are used to group Locations. All Locations are assigned a Folder from this list. A Folder has a parent Folder and can have many child Folders.

Pressing the “Edit” button will allow the details of the selected Folder to be viewed. As all Folders are synchronised from AQUARIUS Time-Series, this information is read only.

Figure 35: Folder Data Entry Form

4.1.4 Folder Types

Each Folder must have a Folder Type. The Folder Type is used to determine the hierarchy of the Folder.

Pressing the “Edit” button will allow the details of the selected Folder Type to be viewed. As all Folder Types are synchronised from AQUARIUS Time-Series, this information is read only.

The screenshot shows the 'Edit Folder Type' form in the AQUARIUS WebPortal. The form has a sidebar on the left with navigation options: Locations and Folders, Parameters and Units, Data Sets, Statistics and Legends, Alerting, Security, and Global Settings. The main form area contains the following fields:

- Name: Region
- Hierarchy Type Name: PRIMARY
- Parent Folder Type: Folder
- Description: Regions are the council area divided into four Quadrants

At the bottom right of the form, there are 'Save' and 'Cancel' buttons.

Figure 36: Folder Type Data Entry Form

4.1.5 Annual Frequency Types

Annual Frequency Types are used to create tables that store values used to calculate Average Recurrence Intervals (ARI) or Return Periods against Statistic Values. Tables are created against specific Parameters in a specific unit.

The screenshot shows the 'Edit Annual Frequency Type' form in the AQUARIUS WebPortal. The form includes a subtitle: 'Annual Frequency Types are used to set the dimensions used when creating an Annual Frequency Definitions.' The form contains the following fields:

- Name: ARI
- Parameter: Rainfall
- Unit: Millimetres
- Frequency (years): 1,2,5,10,20,50,100
- Duration Dimension (minutes): 5,10,15,30,60,120,180,240,300,360,720,1080,1440

Figure 37: Annual Frequency Type Data Entry Form

In the example Figure 37 an Annual Frequency Type has been created for Rainfall in millimetres. The table will contain columns for Frequency (expressed in years), it will also include rows for Duration (expressed in minutes). Decimal numbers are not supported.

4.1.6 Annual Frequency Definitions

Annual Frequency Definitions are used to calculate **Average Recurrence Intervals** or **Return Periods** against Statistic Values. The Annual Frequency Definition stores a table of values and links to a single Location or multiple Locations where these values in the table will be applied.

Edit Annual Frequency Definition



Annual Frequency Definitions are used to help calculate Average Recurrence Intervals (ARI's) and Annual Exceedence Probabilities (AEP's) against Statistics.

Name	<input type="text" value="GCCC_T"/>
Annual Frequency Type	<input type="text" value="ARI"/>
Description	<input type="text"/>

Locations

Add Locations associated to the Annual Frequency Definitions. Locations can only be assigned to one Annual Frequency Definition per Type.

Locations	<input type="text" value="Search for a Location..."/>	<input type="button" value="+ Add Location"/>
Location		Actions
40848 - Lower Springbrook Alert		<input type="button" value="🗑"/>
540400 - Upper Springbrook AL		<input type="button" value="🗑"/>
40341 - WONGAWALLAN ALERT		<input type="button" value="🗑"/>

Figure 38: Annual Frequency Definitions Data Entry Form

After selecting the Annual Frequency Type, the Annual Frequency Table will appear at the bottom of the Data Entry Form.

The table will have columns for each of the Frequencies specified against the Type. It will also optionally have rows for each of the Durations specified against the Type. Data such as Rainfall (which is event-based) would include a Duration whereas data such as Stage wouldn't.

The example Figure 39 shows the Annual Frequency Table with different durations and years. In this example Average Recurrence Intervals (ARI's) can be calculated against 5, 10, 15, 30 minutes, 1 – 6 hour, 12, 18 and 24 hour durations. The ARI's can be calculated as a value of 0 or anywhere between 1 and 100 (by interpolating between values in the table).

If for example there was exactly 13.9 mm worth of Rainfall over a 5 minute period, this would give an ARI of 5. If the 5 minute period value was anything exceeding 24.7 mm, this would be an ARI of 100. As the Annual Frequency Table does not extend past 100, there is no way to accurately calculate an ARI value greater than this number.

There is no import mechanism for parsing data automatically into WebPortal Annual Frequency Tables, since these are customized by the user for different values around the world. Each value needs to be entered separately and applied to one or more locations.

Annual Frequency Table

Fill in the table with values that would occur on the specified frequencies.

	1 year	2 years	5 years	10 years	20 years	50 years	100 years
5 minutes	9.1	10.3	13.9	16.4	18.8	22.1	24.7
10 minutes	15	16.8	22.5	26.3	29.9	34.7	38.4
15 minutes	19	21.3	28.4	33.1	37.7	43.6	48.1
30 minutes	26.4	29.6	39.6	46.4	53	61.8	68.5
1 hour	34.2	38.6	52.7	62.6	72.5	85.9	96.5
2 hours	43.8	49.9	70	84.6	99.6	120.8	138.1
3 hours	51.1	58.5	83.6	102.1	121.4	149.1	171.9
4 hours	57.4	66.1	95.5	117.4	140.5	173.8	201.4
5 hours	63.1	73	106.4	131.4	157.9	196.1	228
6 hours	68.4	79.3	116.4	144.3	173.8	216.5	252.2
12 hours	95	111.3	166.5	207.6	251	313.4	365.4
18 hours	115.8	136.3	205	255.6	308.3	383.2	444.8
1 day	133	156.9	236.1	293.7	353.1	436.6	504.5

Figure 39: Annual Frequency Definition - Table

4.2 Parameters and Units

The Parameters and Units section allows the user to view Parameters, Units and Unit Groups that have been synchronised in from AQUARIUS Time-Series. The section also contains Parameter Range Definitions which are used to create ways of classifying data at the Parameter, Location Type or Location level.

4.2.1 Parameters

The Parameters screen displays a list of Parameters synchronised into the system.

Pressing the “Edit” button for a Parameter will display a read-only view of the Parameter details. If any Parameter Range Definitions with a Parameter Context have been defined for that Parameter, the values can be set here.

The screenshot shows the 'Edit Parameter' form in the AQUARIUS WebPortal. The form is titled 'Edit Parameter' and has a 'Cancel' button at the bottom right. The form contains the following fields:

- Identifier: Alka
- Name: Alkalinity As CaCO3
- Unit Group: Concentration
- Default Unit: Milligrams per litre
- Minimum Value: 0
- Maximum Value: 1000
- Gap Tolerance (min): 0
- Interpolation Type: 7 - Discrete Values: Discrete sample values

Figure 40: Parameter Data Entry Form

4.2.2 Parameter Range Definitions

Parameter Range Definitions are used to create Ranges that can be set against Parameters as well as Location Types and Locations on a per-Parameter basis. They allow you to set values specific to those three contexts that can store information such as environmental compliances ranges, flooding levels, water usage rights, reservoir spill levels, etc.

As an example, consider a “Flooding Levels” Parameter Range Definition that defines the concept of a ‘Minor’, ‘Moderate’ and ‘Major’ Flooding Levels of the Stream Height Parameter. If we select ‘Location’ as the only context, the flooding levels can be defined at each Location in the system.

The classification type will determine how the Parameters of the Parameter Range Definition are defined. There are two Classification Types; Compatible Parameters and Non-Compatible Parameters.

- Compatible Parameters are used where there is only one Unit used, but there can be multiple Parameters of that unit. As an example, if “Metres” is chosen as the Unit, the Parameters must be measured in metres, so Stream Height, Tide Level and Reservoir Level could potentially be chosen as Parameters, as they can be measured in metres.
- Non-Compatible Parameters are used to group Parameter Ranges that do not have a common Unit, but have a common theme. As an example, consider the theme of water quality guidelines that require the pH, Water Turbidity and Dissolved Oxygen Concentration Parameters to be within certain compliance Ranges. These Parameters all have different Units (pH units, Nephelometric Turbidity Units and Milligrams per Litre respectively), but by grouping the three different Parameters, the water quality guideline values can be stored together.

Figure 41: Parameter Range Definition Data Entry Form

Once the Context, Classification Type and Parameters have been defined, the Ranges can be added. Each Range Value represents a value to be stored against the Context, with a Display Name indicating what the value represents. In our example above we want to store the three flooding levels (Ranges) at each Location (Context) in the system.

An optional Legend Style can be set which allows you to overlay the data on Charts and create Legends based on the Parameter Range values. Legends created from Parameter Ranges use the Legend Style set here.

The final section of the Parameter Range Definitions screen allows the user to configure the Parameter Range values to be optionally overlaid on Charts. You can choose not to have the values overlaid, or to Overlay as Lines, Overlay as Bands (Open Ended) or Overlay as Bands (Closed).

Closed bands would be used for something like environment tolerances Ranges with maximum and minimum allowed values.

Open Ended bands would be used for something like flooding where anything above a certain level is considered flooded.

4.2.3 Units

The Units screen displays a list of Units synchronised in from AQUARIUS Time-Series.

Selecting the “Edit” option for any Unit will load a read-only view of the Unit’s properties.

The screenshot shows the 'Edit Unit' form in the AQUARIUS WebPortal. The form is titled 'Edit Unit' and contains the following fields:

- Identifier: °F
- Unit Group: Temperature
- Symbol: °F
- Singular Name: Fahrenheit
- Plural Name: Fahrenheit
- Base Multiplier: 0.5555555555555556
- Base Offset: 459.67

A 'Cancel' button is located at the bottom right of the form.

Figure 42: Unit Data Entry Form

4.2.4 Unit Groups

The Units screen displays a list of Units synchronised in from AQUARIUS Time-Series. Unit Groups are used to logically group Units which allows for easy conversion between units measuring the same thing.

Selecting the “Edit” option for any Unit Group will load a read-only view of the Unit Group’s properties.

The screenshot shows the 'Edit Unit Group' form in the AQUARIUS WebPortal. The form is titled 'Edit Unit Group' and contains the following fields:

- Identifier: Amount Concentration
- Base Unit: Moles per cubic metre
- Name: Amount Concentration
- Dimension Length: -3
- Dimension Mass: 0
- Dimension Time: 0
- Dimension Current: 0
- Dimension Temperature: 0
- Dimension Substance: 1
- Dimension Intensity: 0

A 'Cancel' button is located at the bottom right of the form.

Figure 43: Unit Group Data Entry Form

4.3 Data Sets

The Data Sets section contains areas to manage Data Sets in the system and State values that can be calculated against Data Sets.

4.3.1 Data Sets

The Data Sets screen displays a list of Data Sets synchronised in from AQUARIUS Time-Series.

Selecting the “View” option for any Data Set will load a read-only view of the Data Set’s properties.

Edit Data Set ?

Data Set Id	HG.E1543@540112
Location	Hayward St, Stafford (540112)
Label	<input type="text" value="E1543"/>
Description	<input type="text"/>
Comment	<input type="text"/>
Parameter	<input type="text" value="Stream Height"/>
Unit	<input type="text" value="Metres"/>

Figure 44: Data Set Data Entry Form

4.3.2 Data Sets Blacklist

The Data Set Blacklist displays a list of Data Sets that have been flagged by administrative users as having malformed data (perhaps due to telemetry spikes or calibration, etc.). Blacklisting a Data Set stops that Data Set from triggering Alerts. This includes who blacklisted the Data Set, when and the reason they have given.

The Data Set Blacklist is intended as a temporary solution until the problem with the Data Set has been identified and rectified, or the malformed data is no longer relevant to the Alerts.

For a Data Set that is permanently being retired, it should be De-activated, not Blacklisted.

Data Sets can be removed from the Data Set Blacklist by pressing the “Remove” button in the Actions column of the grid.

Data Sets can be added to the blacklist via the Locations tab (see section 4.1.1.1) and the Data Sets tab (see section 4.3.1).

4.3.3 Data Set Reference Types

Data Set Reference Types are used to create Data Set References. Data Set References are used to create references between Locations and Data Sets at other Locations. The Data Set Reference Type sets up what that Reference will be used for and how it will be used.

A Data Set Reference Type contains a Parameter and Unit. The Data Set Reference must be of the Parameter specified against the Type, values associated with the Data Set Reference must be of the Unit.

Edit Data Set Reference Type



Data Set Reference Types are used to create references between Locations and Data Sets at other Locations. These Referenced Data Sets are then classified with value ranges against the Location.

Name: Flood-Prone Roads

Description:

Parameter: Stream Height

Unit: Metres

Map Overlay: Yes No

Map Overlay Symbol: Square

Map Overlay Symbol Size: 20

Map Legend: Flood-Prone Road

Chart Overlay: Yes No

Chart Overlay Colour:

Figure 45: Data Set Reference Type Data Entry Form

The Map Overlay and Chart Overlay options choose how the Data Set References are displayed. Map Overlay allows the Data Set References to be added as a layer on the Map with choice of symbol, size and Legend used to classify (this classifies a calculated state).

Chart Overlay allows the Data Set References to appear as additional Chart Overlay options when viewing the Chart sub-tab in the Data Set Overview. The Data Set References each appear as a line on the Chart indicating their level, or a colour band (where both a minimum and maximum value have been specified).

4.3.4 Data Set References

Data Set References are used to create references between Locations and Data Sets at other Locations. After selecting a Data Set Reference Type the Location can be associated with a Data Set. The Data Set must match the Parameter set against the Data Set Reference Type.

Edit Data Set Reference



Data Set References are used to create references between Locations and Data Sets at other Locations. These Referenced Data Sets are then classified with value ranges against the Location.

The form contains the following fields and values:

- Location: 10 - Bennett Road
- Data Set Reference Type: Flood-Prone Roads
- Data Set: 540118 - Bancroft Park, Kelvin Grove
- Stream Height: Stream Height.E1531@540118
- Range Minimum: (empty)
- Range Maximum: 3.8
- Description: When Stream Height.E1531@540118 reaches 3.8 m, Bennett Road will be inundated with water.
- Active: Yes No

Figure 46: Data Set Reference Data Entry Form

A value is then set against the Minimum, Maximum or both. In the example Figure 46 the value of 3.8 metres is set against the Range Maximum. This would indicate that for this Location, if the Referenced Data Set reached 3.8 metres or above, that would indicate something, with this specific example indicating the road is inundated with water.

Descriptions can be added against Data Set References to explain the relationship and values.

Data Set References can also be set as inactive. An inactive Data Set Reference won't appear on the Map or Charts and won't have states calculated against it.

4.4 Dashboards

Dashboards are used to display a series of widgets, allowing a quick overview of any data in the WebPortal. Each Dashboard is made up of a series of Widgets, and each Widget is based on a Widget Template. The Administrator can create and edit Widgets and Widget Templates, and control how they are placed on each Dashboard.

4.4.1 Dashboards

A dashboard contains Widgets and determines the location of the Widgets on the page. Dashboards can be created by pressing the "Add New Dashboard" button above the Dashboards list. Each Dashboard will need a unique name, and have an Active flag set. The default licence allows any number of Dashboards to be created, however only two can be Active at any one time.

Once a Dashboard has been created, the Configure screen will be displayed.

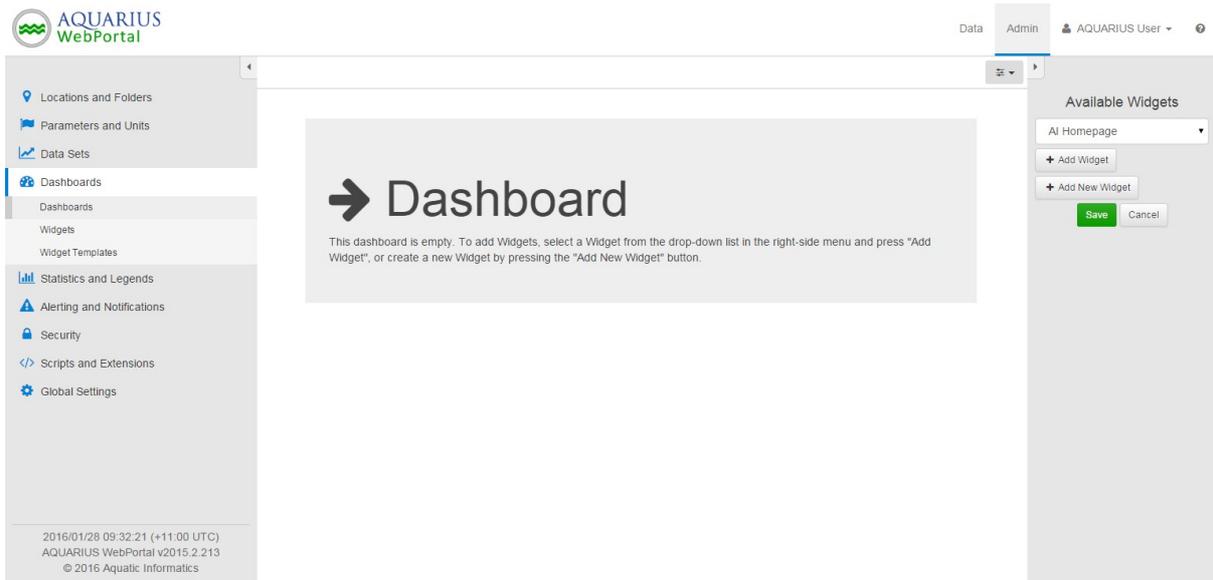


Figure 47: Dashboard Configure Screen

Available Widgets are displayed in the Drop Down menu on the Right-Side Panel. Selecting a Widget and pressing the “Add Widget” button will place the Widget on the Dashboard, where it can be moved and resized.

If the user has permissions to create Widgets, the “Add New Widget” button will be available. Pressing this button will allow the user to create a Widget and add it to the Dashboard in one step. This Widget form is the same as that found under the Widgets tab (see Section 4.4.2). However, creating a Widget from this form (instead of from the Widgets tab) will allow the Widget to be set as “Embedded”. An Embedded Widget is associated only with one Dashboard, and will not appear in the Widgets list. It will instead appear on the Right-Side Panel of the Dashboard, where it can be added, edited or deleted.

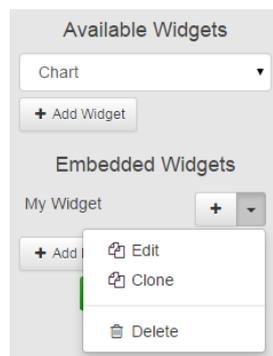


Figure 48: Embedded Widgets List

4.4.2 Widgets

Each Widget is based on a Widget Template, and contains information on what data to use and display on the Dashboard. Widgets can be created by pressing the “Add New Widget”

button above the Widgets list. Each Widget will need a unique name, and have a Widget Template assigned. Further details and instructions for using the System Widget Templates can be found in section 8.5.

The Widget Template determines what input is required in each Widget. When a Widget Template is selected, the required Input Variables will be displayed. Each Input Variable can be set to “Fixed” or “Widget”. Fixed will set the Variable so that it cannot be changed, whereas Widget will allow the user to change the Variable value on the Dashboard. If any instructions have been set in the Widget Template, they will also be displayed to help the user create the Widget.

The screenshot shows the 'Edit Widget' form with the following sections:

- Edit Widget:** A sub-header with a note: "Widgets are panels displayed on a dashboard. Choose a name and Widget Template for the Widget". It contains a text input for 'Name' with the value "Water Data Management - Faster Analysis. Better Decisions." and a dropdown menu for 'Widget Template' set to "Youtube".
- Instructions:** A text box containing: "Insert the Video Id into the Videoid below. The YouTube Video Id can be found at the end of any YouTube Video URL. In the example shown below, the Id is set to bold." followed by the URL "https://www.youtube.com/watch?v=**dQw4w9WgXcQ**".
- Input Variables:** A section with a note: "Use the Input Variables to set where the data will come from for your Widget". It features a dropdown for 'VideoID' set to "Fixed" and a text input for 'Value' containing "8cwinIjh_dQ".
- Advanced Settings:** A section with a note: "Use Advanced Settings to control how the Widget is displayed on the Dashboard." It includes three rows of radio buttons: "Show Header" (Yes selected), "Show Title" (Yes selected), and "Show Refresh Button" (No selected).

Figure 49: Widget Form

Some widgets will have a Content Text Area available in the Input Variables. This option appears when the Widget Template has the “Content In Widget” flag set to True (see section 4.4.3).

The Advanced Settings section allows the user to set the visibility of the Widget Header and Footer, and control the contents of these elements. The Header can be set to display the Widget Title, Refresh Button and minimise button if visible. Custom content (text or HTML) can be entered into the Footer if visible.

Widgets and Widget Templates can be set as Static. This will prevent the Widget from loading dynamically, and it will instead load with the Dashboard. When a Static Widget Template is used, the Widget must be Static.

An Update Interval can also be set in the Advanced Settings. When an Update Interval is set, the Widget will refresh at the end of each interval. The Update Interval is in seconds.

Advanced Settings

Use Advanced Settings to control how the Widget is displayed on the Dashboard.

Advanced Settings form details:

- Show Header: Yes No
- Show Title: Yes No
- Show Refresh Button: Yes No
- Show Minimise Button: Yes No
- Show Footer: Yes No
- Footer Content:
- Static: Yes No
- Update Interval:

Buttons: Create Cancel

Figure 50: Widget Advanced Settings

Note: The same Widget from is available from the Dashboard Configure page for users with permissions to edit and create Dashboards and Widgets. The form found on the Dashboard Configure Page also allow the Widget to be Embedded in the Dashboard.

4.4.3 Widget Templates

Widget Templates contain the layout and JavaScript of the Widgets that use them, as well as defining any Variables to be set by the User. Widget Templates also contain an Instructions field which is visible in the Widget form when a Widget Template is selected.

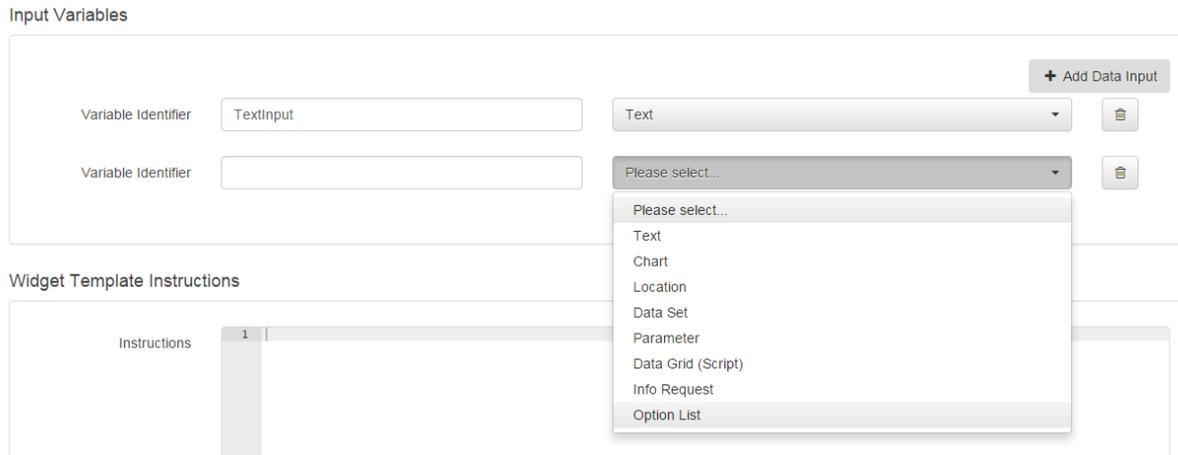


Figure 52: Widget Template Input Variables

A placeholder is created by entering two hash (#) symbols before and after the Variable Identifier. For example, the placeholder for the Variable “MyText” would be entered into the Content, Javascript or Refresh Method as “##MyText##”.

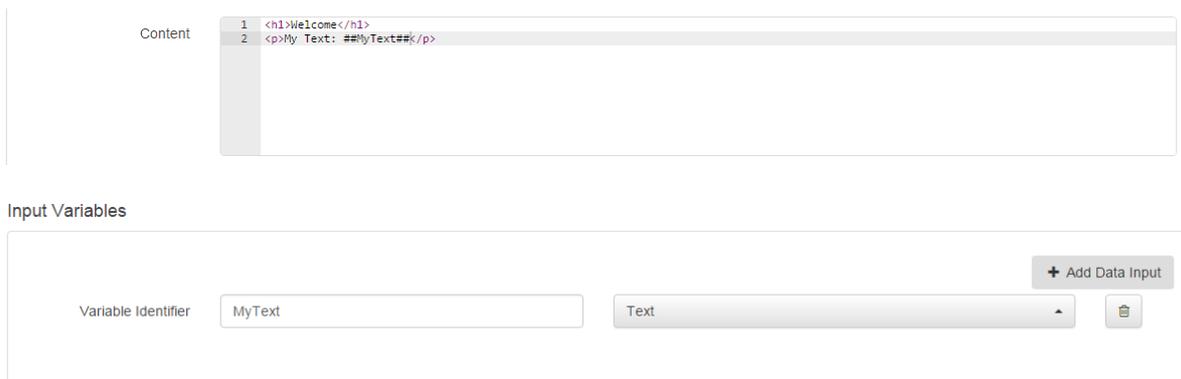


Figure 53: Input Variable and Placeholder

Placeholders can also be created for System Variables. In AQUARIUS WebPortal, there are three System Variables defined. These are described in Table 3.

System Variable Name	System Variable Value
##WIDGETIDENTIFIER##	The unique Id of the Widget on the Dashboard. Can be used in the Widget Template JavaScript to reference the instance of the Widget and its contents on the page.
##WIDGETHEIGHT##	The height (in pixels) of the rendered Widget.
##WIDGETWIDTH##	The width (in pixels) of the rendered Widget.

Table 3: Widget Template System Variables

There are several System Widget Templates included with AQUARIUS WebPortal. System Widget Templates cannot be edited, however they can be cloned and then modified. Descriptions for all System Widget Templates are found in section 8.5.

4.5 Statistics and Legends

The Statistics and Legends section contains areas that allow the creation of Statistics that are calculated against Data Sets, intelligent ways of displaying those values and then ways of classifying that data through coloured Legends.

4.5.1 Statistic Definitions

Statistics that are calculated against a Data Set can be created against Parameters. Statistics are created using a natural-language calculation; this allows many different possibilities for custom Statistics to be created. A Statistic Definition can be made for a particular Unit and Unit Group against any number of Parameters that use that unit.

There are two different Data Entry Forms for creating a Statistic Definition.

1. “Add New Statistic Definition (Single Parameter)” button opens up a simplified Data Entry Form designed for a Statistic that applies to a single Parameter.
2. “Add New Statistic Definition (Multi-Parameter)” button opens up a more complex Data Entry Form designed for adding a Statistic that applies to multiple comparable Parameters. An example of this would be Stage, Reservoir and Tide where all three Parameters are measuring the same thing, a Level relative to Sea Level.

If in doubt, use the Single Parameter Option.

The **Identifier** field is the internal name used in the Admin section only and must be unique to the Interval and list of Parameters (name is used when creating Alerts based on Statistic values). It is best practice to use ALL CAPS for all Identifiers. It is also useful to use ‘01’ when adding a definition for 1, e.g. “HEAVIEST01H” instead of “HEAVIEST1h”

The **Display Name** is used in menus and selections outside of the Admin section. When selecting a Statistic to show on the map, the Display Name is used in the select box.

Choose Interval **Type**> Latest or Periodic (Daily, Monthly, Yearly). Latest Statistics are calculated for data within the MaxDataAge set in Global Settings.

Choose **Active** “Yes” to calculate statistics. Inactive Statistic Definitions are not calculated.

For a Single Parameter Statistic you directly select a **Parameter** and **Unit**. For a Multi-Parameter Statistic you will need to select a **Unit Group** and Unit first, then select and Add Parameters (selecting the Unit Group first ensures all Parameters are in the same Unit Group).

Figure 54: Statistic Definition Data Entry Form

For each Parameter selected, choose the **Precision** (# of decimal places) and relevant **Legend**. For a **Periodic** Statistic Definition, different legends can be set for each **Interval**. Multiple Legends can be applied to each Interval giving the user different options for displaying data on the map.

Calculations can be added using the “Add Calculation” button. For each calculation, four fields will become available under the parameter details:

- **Calculation** is the natural language calculation used to process the data see section 8.3 for full reference details.
- The **Update Interval**, measured in minutes, can be set to force the Statistic to update. This is useful for where the input data is not updated regularly, for example, where forecast data is pre-loaded into a system on a regular basis.
- **Processes** can be used to pre-process time-series data before the Statistic is computed (e.g. Decumulate, FactorOffset etc).
- The **Data Set Label Filter** can be used to filter the Data Sets for which the calculation applies.

4.5.2 Statistic Summaries

The Statistics Summaries tab allows for the creation of a meaningful way to display different Statistics that have been calculated. Some Statistics are not as useful displayed in isolation, Statistic Summaries provide this value.

When creating a Statistic Summary a Parameter (or Parameters) and Type must be selected to display the full interface for creating the summary. Making a change to either Parameter (adding or removing a parameter) or Type will clear out the Format String and remove all values.

To help create a Statistic Summary the Parameters selected display a count of the common Statistic Definitions available. At least one common Statistic Definition is required to make a Statistic Summary.

Once a Type and Parameters are selected click the “Add Value” button to add new Statistic Definitions into the Summary.

The Format String is used to specify how the data will be displayed on screen. Curly braces { } with numbers inside represent the Format String values. The number in the first column corresponds to the number in the curly brace.

The screenshot shows the 'Edit Statistic Summary' interface. At the top, the 'Display Name' is 'Maximum', the 'Type' is 'Periodic', and the 'Parameters' are 'Reservoir Level, Stream height, Tide Level AND'. Below this is the 'Define Summary Values' section. The 'Format String' is '{0.00}[1] @ {2}HR:mm:ds[M]'. There are three rows of values defined:

Number	Statistic	Value	Actions
+ 0	Maximum	Statistic Value	[Edit]
+ 1	Maximum	Unit (nullable)	[Edit]
+ 2	Maximum	Event Time (Nullable)	[Edit]

At the bottom, a 'Test Statistic Summary' button is visible. A message box shows the results of the test:

```

✓ Format String is specified correctly!
Summary Message: 22:45m @ 12:21 28/09
Test Values:
[0] = 22.450664468077
[1] = m
[2] = 28/09/2014 12:21:36 PM
  
```

Figure 55: Statistic Summary Data Entry Form

A Summary Value with a sample Format String and three values is shown in Figure 55. After the “Test Format String” button is clicked, the results of testing the Statistic Summary are shown, this uses randomised data to help test how the summary will display.

Format Strings are used in Statistic Summaries and Alert Templates, for more information see section 8.8 for reference material.

4.5.3 Statistic Summary Groups

The Statistic Summary Groups tab allows for the creation of Groups for the Statistic Summaries. Statistic Summaries are displayed in popups on the Map, adding more

Summaries extends the popup size. Grouping the Summaries helps to keep the popup a manageable size and display data together logically.

- A popup indicator showing the Statistic Summary Group for the Rainfall Parameter
- Each Display Group becomes a tab within the popup window
- The Display Groups can be ordered by clicking and dragging from the arrows at the left column on the Display Group table.
- It is recommended that a maximum of 6-8 statistics is added to a group, allowing adequate space for the popup in the map
- Ungrouped Statistic Summaries will be displayed in a group called 'Statistics'.

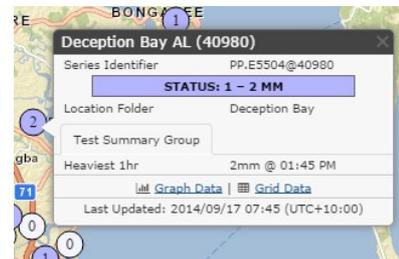


Figure 56: Statistic Summary Group Data Entry Form

4.5.4 Legends

The Legends tab displays a list of the Legends used to classify Values, Parameter Ranges and State Values.

To classify data, a Legend is made up of Legend Bands. These Legend Bands contain the logic used to figure out where a Value falls within that Legend.

Legend Band	Display Text	Calculation	Options
1	<input type="text"/>	= <input type="text"/>	<input checked="" type="checkbox"/> Include <input type="checkbox"/> Don't Include <input type="checkbox"/> Is Default

Figure 57: Legend Band Elements

The elements of each Legend Band are as follows:

1. Legend Band Colour/Number: example colour display of the Legend Band
2. Display Text: exact words to be shown in the Legend Band
3. Calculation/State: how the Legend Band is classified
4. Options: "Include" selected will be on the list, "Don't Include" removes Band from Legend and "Is Default" means the indicator value will default to this band (when it can't be classified)

When a Legend Style is selected, the Legend Bands become available for customisation.

The screenshot shows the 'Edit Legend' interface. At the top, there are four dropdown menus: 'Name' (Flood Type), 'Type' (States - Parameter Range), 'State Definition' (MINSTATE), and 'Legend Style' (Flood). Below this is the 'Legend Bands' section, which contains a table with six rows. Each row represents a legend band with a color-coded icon, a display text field, a state dropdown, and three option buttons (Include, Don't Include, Is Default).

Legend Band	Display Text	State	Options
1	No Signal	NOVALUE	Include Don't Include Is Default
2	Not Classified	NOTCLASSIFIED	Include Don't Include Is Default
3	Normal	DEFAULT	Include Don't Include Is Default
4	Minor Flooding	MINOR	Include Don't Include Is Default
5	Moderate Flooding	MODERATE	Include Don't Include Is Default
6	Major Flooding	MAJOR	Include Don't Include Is Default

Figure 58: Legend Data Entry Form

There are currently three different types of Legends that can be used to classify data. For more information on creating Legends, see the workflow examples in section 7.3.2, section , and section 7.3.5.

4.5.5 Legend Styles

A Legend Style is a colour scheme or palette that is used to give colour to Legends (which classify data). Legend Styles are created by adding bands of colour (text and background).

While the background and text colour can be set to any colour value, by convention the text colour would be black or white to contrast with the background as shown in Figure 59.

Edit Legend Style ?

Identifier

[+ Add Legend Colour Band](#)

Number	Background Colour	Text Colour	Actions
+ 1 Example			
+ 2 Example			
+ 3 Example			
+ 4 Example			
+ 5 Example			
+ 6 Example			

Figure 59: Legend Style Data Entry Form

Legend Bands can be re-ordered by clicking and dragging a band from the move symbol next to the band number.

4.5.6 State Definitions

State Definitions are used to calculate or infer states against Locations and Time-Series. These States can then be used for triggering of Alerts or in creation of Legends to visually classify data.

There are four different types of State Definition:

1. Parameter Range
2. Script Function – Time-Series
3. Script Function – Location
4. Script Function – Location with Data Set References

After the type is selected different options will be displayed which are used to calculate or infer the State.

4.5.6.1 Parameter Range

A Parameter Range State is an inferred state. The state is evaluated against a Statistic value and is not stored.

For the State Definition you create States based on the Parameter Range values and three default states. The default states are as follows:

- **No Value:** The value being evaluated does not exist (statistic value is null)
- **Not Classified:** No Parameter Range values are set against the related Parameter, Location Type or Location context

- **Default:** The value being evaluated does not fall into any other defined states

Each added state will qualify a Statistic value against the Parameter Range values. For example, a state can be created such that if the value of the Statistic is “Greater than or Equal to” the “Major Flooding Level” (defined in the Parameter Range Definition), the State will be set to “MAJOR”. This state, along with two others, can be seen in Figure 60.

Qualifier	Value	State	Options
	Value being evaluated is null	= NOVALUE	
	No Parameter Range values exist for the Data Set, unable to evaluate state	= NOTCLASSIFIED	
+ 1	Value is >= (Greater than or Equal to) Major Flooding Level	= MAJOR	
+ 2	Value is >= (Greater than or Equal to) Moderate Flooding Level	= MODERATE	
+ 3	Value is >= (Greater than or Equal to) Minor Flooding Level	= MINOR	
	Value falls outside the Parameter Ranges as defined above	= DEFAULT	

Figure 60: State Definition Data Entry Form

States are evaluated from top to bottom. If a value is null, the State will be NOVALUE, otherwise if the Parameter Ranges are all empty the State will be NOTCLASSIFIED, if the value is above either the Major, Moderate or Minor Flooding Levels it will be assigned the equivalent State. Otherwise if these States all fail to evaluate the State is set as DEFAULT, which in this case would be below our three flooding levels.

Qualifier	Value	State	Options
	Value being evaluated is null	= NOVALUE	
	No Parameter Range values exist for the Data Set, unable to evaluate state	= NOTCLASSIFIED	
+ 1	Value is > (Greater than) Maximum	= NONCOMPLIANT	
+ 2	Value is < (Less than) Minimum	= NONCOMPLIANT	
	Value falls outside the Parameter Ranges as defined above	= DEFAULT	

Figure 61: Parameter Compliance State Example

A second example using Maximum and Minimum compliance Range values is shown in Figure 61. If the value being evaluated is Greater Than the Maximum value, it is NONCOMPLIANT if the value is Less Than the Minimum value it is also NONCOMPLIANT, the DEFAULT in this case would be a compliant value.

4.5.6.2 Script Function – Time-Series

A Script Function – Time-Series state is a calculated and stored state against a Data Set. This state type uses a script to perform a calculation over a Time-Series, either the actual Time-Series data or the meta-data and output a textual value which is saved as the State.

The Parameters selector can be used to filter the Parameters that a script is executed over. The Update Interval controls how often the script will be run to recalculate the State.

The Script Function sets the actual script that will be executed and allows additional arguments to be passed in. Script functions used should be of type “State Calculation - Time-Series”.

4.5.6.3 Script Function – Location

A Script Function – Location state is a calculated and stored state against a Location. This state type uses a script to perform a calculation over a Location meta-data and output a textual value which is saved as the State.

The Location Types selector can be used to filter the Locations that a script is executed over. The Update Interval controls how often the script will be run to recalculate the State.

The Script Function sets the actual script that will be executed and allows additional arguments to be passed in. Script functions used should be of type “State Calculation - Location”.

4.5.6.4 Script Function – Location with Data Set References

A Script Function – Location with Data Set References state is a calculated and stored state against a Location. This state type uses a script to perform a calculation over a Location’s Data Set References and output a textual value which is saved as the State.

A Data Set Reference Type must be selected to choose which Data Set References the script is executed over. The Update Interval controls how often the script will be run to recalculate the State.

The Script Function sets the actual script that will be executed and allows additional arguments to be passed in. Script functions used should be of type “State Calculation – Location with Data Set References”.

4.5.7 Heat Map Definitions

Heat Map Definitions are used to generate Heat Maps and Isolines against calculated Statistic Values. These Heat Maps and Isolines are then able to be overlayed on the Map.

To generate a Heat Map, select a Type, Parameter and Statistic. For a Latest Heat Map, you will need to specify a single Legend. For a Periodic Heat Map you can specify a different

Legend for each of the Intervals. Legends are optional for each of the Intervals, if you don't specify one, the Heat Map won't be generated for that Interval.

The Heat Maps also includes display options of whether to show both the Heat Map and Isolines, or display the Heat Map or Isolines individual. You can also adjust the opacity from between 0 and 1 (1 being 100% opaque).

For the Generation Options any change will require the Heat Maps to be regenerated. The Spatial Reference Code is needed to determine what coordinate system to generate the Heat Map in (use 4326 for the standard WGS 84). The Image Size can be used to control the quality of the Heat Maps generated and can also be used to reduce the space consumed by generated Heat Maps (especially for Daily Periodic data).

The Heat Maps use Inverse Distance Weighting as the generation algorithm. There are two options that can affect how the Heat Map is generated, the IDW Power and IDW Radius. Default options would be 4 and 0 respectively.

For more information on Inverse Distance Weighting and how to use the Power and Radius options, see the following reference:

http://resources.esri.com/help/9.3/arcgisdesktop/com/gp_toolref/geoprocessing_with_3d_analyst/implementing_inverse_distance_weighting_idw_in_3d_analyst.htm

NOTE: AQUARIUS WebPortal Heat Maps use a variable search radius, meaning the IDW Radius is the number of points in the above reference (the search distance isn't required).

4.6 Alerting and Notifications

Alerting and Notifications involves creating Alerts which trigger when certain conditions are met, conditions outside the normal ranges. Alert message can then be displayed to Signed In users notifying them of the Alert condition as well as emails and text messages (SMS) being sent to People subscribed to receive them.

4.6.1 Alerts

The Alerts tab lists all Alerts in the WebPortal including Alerts that belong within an Alert Template. Alerts can be created from here either as Individual Alerts or Alerts added to a currently existing Alert Template.

NOTE: When Creating or Editing a Template-Based Alert the majority of the Data Entry Form is disabled. While the Alert Trigger Parameters can be entered the rest of the options can only be changed by editing the Alert Template.

An Alert Trigger is used to define the condition under which an Alert is triggered. Alert Trigger Functions are described in detail in section 8.7. A Trigger Function must be selected for each template.

The Update Interval is how often the Alert will re-trigger while still in an Alert State. Without a value the Alert will only trigger once when the conditions are first met.

For the Alerts to be sent as emails and text messages (SMS) Distribution Groups are assigned, all People subscribed to these Groups will receive the notifications.

Edit Alert

Type Individual Alert

Alert Template Nothing selected

Trigger Function LatestStatCheck

Update Interval (minutes) 10

Distribution Groups Nothing selected

Description

SeriesIdList HG.E1555@540312

StatNames MAXIMUM24H

TriggerConditions >3

Alert Trigger Function LatestStatCheck("HG.E1555@540312", "MAXIMUM24H", ">3")

Alert State Normal

Trigger Function Valid?

Active Yes No

Figure 62: Alert Data Entry Form

In Figure 62 the example has “LatestStatCheck” selected as the Trigger Function. This Trigger Function includes three Alert Trigger Parameters which have been filled in to make up the Alert Trigger Function.

The form includes an option to test both the validity of the Alert Trigger Function and the current State.

Once the Alert is defined, you can then add Alert Tokens which will form the Alert Message. Tokens have information that is contextual to the current Alert that has been triggered (e.g. information about Location and Statistic the Alert was triggered on).

Alert Messages

Token Number	Token Name	Actions
+ 0	TriggerState	
+ 1	Location.Name	
+ 2	Parameter.Name	

[+ Add Alert Token](#)

Figure 63: Alert Trigger Tokens

Alert Messages are defined using Format Strings where the number is replaced by the token show in Figure 70. A sample Alert Message is shown in Figure 71. Notice the inclusions of “@”, “is” and “at” to improve the message grammatically.

Alert Triggered - Message Definition	<input type="text" value="{{0}} {6} @ {1} {2} is {3:0.00}{4} at {5:HH:mm} {5:MMM d}"/>	Test Message
Alert Triggered - Message Definition has 57 characters		
Alert Un-Triggered - Message Definition	<input type="text" value=""/>	Test Message
Alert Un-Triggered - Message Definition has 0 characters		

Message: [Alert] 24 Hour Average @ Wind River below Boysen Res, WY Height of Gauge (River Stage) is 4.64ft at 20:00 Sep 24	Arguments: ErrorMessage = "", Location.Identifier = '06259000', Location.Name = 'Wind River below Boysen Res, WY', Location.UTCOffset = '0', Parameter.Name = 'Height of Gauge (River Stage)', ParentFolder.Name = 'District 03',
Message Characters: 113	

Figure 64: Sample Alert Message with Tokens defined

Format Strings are used in Alerts, Alert Templates, Statistic Summaries and other sections, for more information see section 8.8 for reference material.

4.6.2 Alert Templates

Alerts can be created individually or within the context of an Alert Template. Alert Templates enable many Alerts that share common behaviour to be more efficiently managed, and created faster.

The Update Interval is how often the Alert will re-trigger while still in an Alert State. Without a value the Alert will only trigger once when the conditions are first met

An Alert Trigger is used to define the condition under which an Alert is triggered. Alert Trigger Functions are described in detail in section 8.7. A Trigger Function must be selected for each template.

For the Alerts to be sent as emails and text messages (SMS) Distribution Groups are assigned, all People subscribed to these Groups will receive the notifications.

The screenshot shows a web form titled "Create Alert Template". The form contains the following fields and controls:

- Name:** A text input field containing "Alert Test".
- Update Interval (minutes):** A text input field containing "5".
- Trigger Function:** A dropdown menu with "LatestStatCheck" selected.
- Distribution Groups:** A dropdown menu with "Alert Testing" selected.
- Description:** A large text area containing "This is an Alert Test".
- Active:** A radio button group with "Yes" selected and "No" unselected.

Figure 65: Alert Template Data Entry Form

Alert Trigger Parameters are specific to Trigger Functions, different options will appear depending on which function is chosen.

To template the Alerts you chose whether you want to enter the values of the trigger function on a "Per Alert" basis or a "Global" basis, with Global allowing you to enter a value once which then appear against all Alerts in the Template.

When you add a New Alert, the fields to populate relate to the Trigger Parameters set “Per Alert” above, the Effective Trigger, State and Test Trigger columns always appear.



Figure 66: Alert Trigger Parameters

Each alert can be built with a different trigger value, and tested to see if it will trigger an Alert. Figure 67, Figure 68 and Figure 69 show the State and Trigger Test before a test, in a Normal State and in an Alert State.



Figure 67: Alerts screen before a test

Effective Trigger	State	Test Trigger
LatestStatCheck("HG.E1555@540132", "MAXIMUM24", ">2")	Normal	✓

Figure 68: Alerts screen in a “Normal” State

Effective Trigger	State	Test Trigger
LatestStatCheck("HG.E1555@540132", "MAXIMUM24", ">1")	Alert	✓

Figure 69: Alerts screen in an “Alert” State

Once you have at least one alert in the list above, you can then add Alert Tokens which will form the Alert Message. Tokens have information that is contextual to the current Alert that has been triggered (e.g. information about location and statistic the alert was triggered on).

Alert Messages

Token Number	Token Name	Actions
+ 0	TriggerState	
+ 1	Location.Name	
+ 2	Parameter.Name	
+ 3	Statistic.Value	
+ 4	Series.Unit	
+ 5	Statistic.TimeStamp	
+ 6	Statistic.DisplayName	

Figure 70: Alert Trigger Tokens

Alert Messages are defined using Format Strings where the number is replaced by the token show in Figure 70. A sample Alert Message is shown in Figure 71. Notice the inclusions of “@”, “is” and “at” to improve the message grammatically.

Alert Triggered - Message Definition	<input type="text" value="[{0}] {6} @ {1} {2} is {3:0.00}{4} at {5:HH:mm} {5:MMM d}"/>	<input type="button" value="Test Message"/>
	Alert Triggered - Message Definition has 57 characters	
Alert Un-Triggered - Message Definition	<input type="text" value=""/>	<input type="button" value="Test Message"/>
	Alert Un-Triggered - Message Definition has 0 characters	

Message: [Alert] 24 Hour Average @ Wind River below Boysen Res, WY Height of Gauge (River Stage) is 4.64ft at 20:00 Sep 24	Arguments: ErrorMessage = "", Location.Identifier = '06259000', Location.Name = 'Wind River below Boysen Res, WY', Location.UTCOffset = '0', Parameter.Name = 'Height of Gauge (River Stage)', ParentFolder.Name = 'District 03',
Message Characters: 113	

Figure 71: Sample Alert Message with Tokens defined

Format Strings are used in Alert Templates, Statistic Summaries and other sections, for more information see section 8.8for reference material.

4.6.3 Distribution Groups

Distribution Groups are used to subscribe People to receive a set of Alerts. A Distribution Group has a number of People and Alert Templates set, such that on any trigger event of any of these Alerts, will send notifications to those People.

When creating or editing a Distribution Group, the administrator can choose which People and which Alert Templates to include. Both the “People in Group” and “Alert Templates in Group” can have multiple options selected. The People selected will receive Notifications from any Alert in the Alert Templates selected.

Figure 72: Distribution Group Data Entry Form

4.6.4 Notifications

The Notifications tab provides an Audit trail of all Notifications that have been emailed and sent via text message (SMS) to people. These notifications could be manually sent messages, password reset details, automatically triggered Alerts and User Alert withdrawal Notifications.

Name	Identifier	Message	Sent By	Recipients	Done	Created Time	Processed Time	Actions
pH Compliance	2	[ALERT-2] pH has breached Water Quality compliance guidelines at Location 541332 in District 3	Auto Triggered	users@example.com; users@example.com;	✓	2014/10/31 00:53	2014/10/31 12:00	Withdraw
-	1	[MSG] Test of a manual notification being sent to an email address	AQUARIUS User	test@aquaticinformatics.com;	✓	2014/10/31 00:51	2014/10/31 12:00	

Figure 73: Notifications Grid

Notifications sent from triggered Alerts can be Withdrawn. The Withdraw button appears in the Actions column, pressing it will bring up a confirmation box where a message can be sent to users informing them of the reason the Notification was withdrawn.

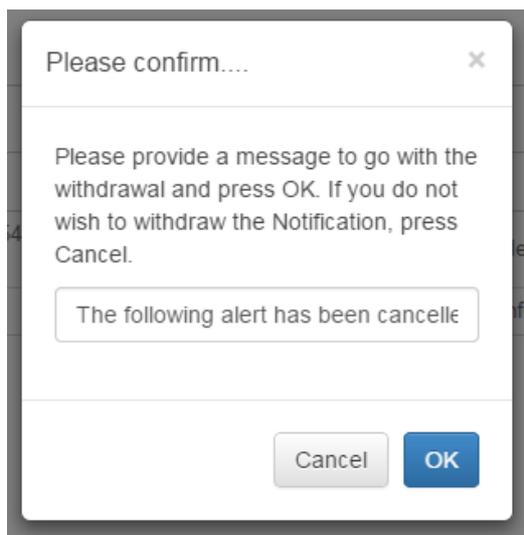


Figure 74: Notification Withdrawal Confirmation

In the example Figure 75 the Notification has been withdrawn due to a faulty sensor reading. Note that once a Notification is withdrawn it cannot be withdrawn again. Also withdrawn or cancel Notifications cannot themselves be withdrawn.

Name	Identifier	Message	Sent By	Recipients	Done	Created Time	Processed Time	Actions
pH Compliance	3	[CANCEL:2] Faulty sensor equipment. pH compliance has not been breached		users@example.com; users@example.com;	✓	2014/10/31 01:04	2014/10/31 12:18	
pH Compliance	2	[ALERT:2] pH has breached Water Quality compliance guidelines at Location 541332 in District 3		users@example.com; users@example.com;	✓	2014/10/31 00:53	2014/10/31 12:00	
-	1	[MSG] Test of a manual notification being sent to an email address		test@aquaticinformatics.com;	✓	2014/10/31 00:51	2014/10/31 12:00	

Figure 75: Withdrawn Notifications

4.6.4.1 Information Request and Manual Notifications

From the Notifications tab Information Requests and Manual messages can be sent out to Distribution Groups, Individual People (from the WebPortal) or to manually entered email and mobile phones numbers (as text messages).

For an Information Request the type is required. If the Information Request needs arguments, these must also be supplied (the Info Request won't be sent until required arguments have been supplied).

Send Information Request ?

Information Request Type: Nothing selected

Information Request Arguments:

Distribution Groups: Nothing selected

Users: Nothing selected

Email Addresses (Separate with a comma):

Mobile Numbers (Separate with a comma):

Send
Cancel

Figure 76: Information Request Notification Data Entry Form

For a Manual Notification the message is required.

Send Manual Notification ?

Message:

Distribution Groups: Nothing selected

People: Nothing selected

Email Addresses (Separate with a comma):

Mobile Phone Numbers (Separate with a comma):

Send
Cancel

Figure 77: Manual Notification Data Entry Form

4.7 Security

The Security tab is used by an administrator to manage People, their Sign In details, Security Roles and View Groups. An Audit Log can also be viewed to track User actions within the WebPortal.

4.7.1 People

People are added to the system through the Admin section from the People tab found under Security.

Within AQUARIUS WebPortal, People added to the system can be configured to Sign In to the system or receive email/text message (SMS) notifications, or both.

The screenshot shows a web form titled "Edit Person" with a help icon in the top right corner. The form contains the following fields:

- First Name: Administrator
- Last Name: (empty)
- Organisation: (empty)
- Job Title: (empty)
- Comments: (empty text area)
- Active: Yes No

Figure 78: Person Data Entry Form

4.7.1.1 User Account

To add a User who can Sign In to the system, a Username is required and the Sign In Enabled and Active fields must be set to 'Yes'. A Security Role is not required for a user to sign in, but one needs to be given for access to the Admin section.

Users can be assigned to a View Group, which will use View Group's Settings in place of the Global Settings. These View Group Settings can be overridden by the user from the Account screen. View groups can also be assigned to a user from the View Group tab.

To Sign In using Windows Authentication, the username must be set to the same username as the user's Active Directory account username. User Accounts can also be associated with Social Media accounts allowing Users to Sign In to the WebPortal without having to type additional usernames and passwords.

NOTE: To set a User's password, after creating a User the administrator must reset the User's password under the Actions menu found on the People grid. A new password will be displayed to the administrator, and the new User will need to change their password when they Sign In.

Against a Person's User Account details there is the option to allow the User access to all Locations. Alternatively a Folder or set of Folders can be added to the User, this gives the User Read permission and can be extended to give them Update and Delete permission also.

NOTE: Folder-based security can be setup to run against the Primary Hierarchy or can be run against a special WebPortal Security Secondary hierarchy.

There is also the ability to give the User access to all Parameters or filter the list of Parameters the user has access to. This has the effect of filter the Time-Series as the User will only be presented with Time-Series that have a Parameter on their list.

NOTE: If a User has been assigned to a View Group the Location and Parameter security is based on their View Group. If a User isn't assigned to a View Group these properties can be set directly against the User.

User Account

To create a User Account, set Sign In Enabled? to Yes and fill in the Account and Security details below.

The screenshot shows a form titled "User Account" with the following fields and options:

- Sign In Enabled?** Radio buttons for Yes (selected) and No.
- Username** Text input field containing "admin".
- Language** Dropdown menu showing "English".
- Security Role** Dropdown menu showing "All Access Super User".
- View Group** Dropdown menu showing "Nothing selected".
- Full Access to all Locations?** Radio buttons for Yes (selected) and No.
- Full Access to all Parameters?** Radio buttons for Yes (selected) and No.
- Can Change Account Details?** Radio buttons for Yes (selected) and No.
- Can Change User Settings?** Radio buttons for Yes (selected) and No.
- Can Change Password?** Radio buttons for Yes (selected) and No.

Figure 79: Person Data Entry Form – User Account

Additional options allow you to control what access a User has over their own account from the Account Section. The Can Change Account Details option can remove the ability for the user to change their Name, Email and Mobile details.

The Can Change Account Settings option can remove the ability for a user to edit their Account Settings. This can effectively mean that any View Group Settings or Account Settings assigned by an Administrative user aren't able to be overridden and can be used to secure what a User has access to.

Lastly you are able to remove the ability for a User to change their own password.

4.7.1.1.1 Social Media Sign In Options

A User Account can be linked to Social Media providers. This allows Signing In using a Social Media account without needing a new username and password. There are five options for Social Media: Google, Facebook, Twitter, Microsoft and LinkedIn.

Click to link the account to one of the providers, for example Google. Details used for Sign In will need to be added. For Google/Facebook/Microsoft/LinkedIn this is an email address, for Twitter this is a Twitter Handle, without the @.

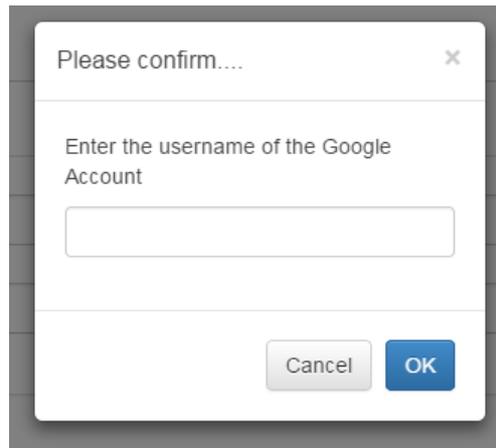


Figure 80: Linking Account to Google

The account is now linked, clicking the Sign In with Google option using the ["aquaticinformatics@gmail.com"](mailto:aquaticinformatics@gmail.com) account will Sign In to the WebPortal automatically.

Social Media Sign In Options

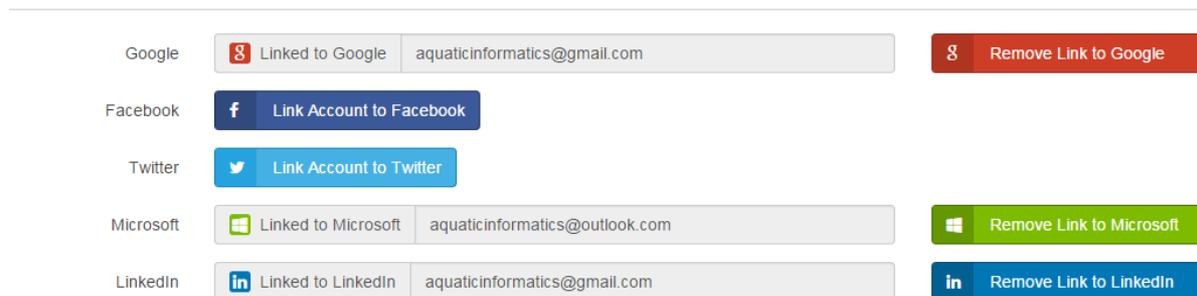


Figure 81: Associated Accounts

4.7.1.2 Notifications

To add People who can receive alerts, either the Send Email or Send Text Message (SMS) value must be set to "Yes". The Person should then be added to Distribution Groups which subscribes them to receive Notifications from Alerts. The Person doesn't require a username if they are just being set up to receive Notifications.

Notifications

Send Email Yes No

Email Address

Email Name

Send Text Message (SMS) Yes No

Mobile Phone Number

Distribution Groups

View Group

Figure 82: Person Data Entry Form - Notifications

NOTE: If Send Email or Send Text Message (SMS) are set to 'Yes', the Email Address and Mobile Phone Number fields will be required.

4.7.1.3 Account Settings

Administrators can directly edit Account Settings through the Account Settings button in Admin. This allows the Administrator to override local Account Settings on their behalf, or pre-configure User's Accounts with desired settings.

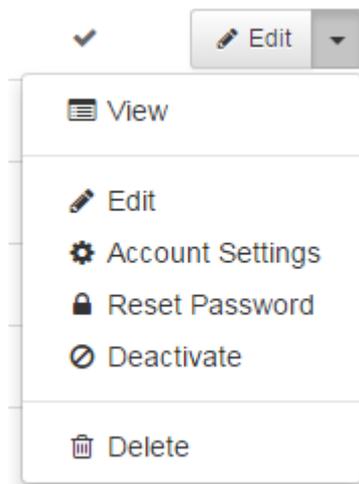


Figure 83: Account Settings

4.7.2 Security Roles

Security Roles allow privileges within the Admin section to be grouped and assigned to Users.

By default, the system has a single role of 'Administrator'. The Administrator is the built-in Role that has access to everything. This Role doesn't appear in the list of Security Roles as it cannot be edited.

Creating a Security Role gives control over which users have access to which Tabs within the Admin section and what level of control they have within those tabs. Each Security Role has standard CRUD operations of Create, Read, Update and Delete which apply to each of the tabs within the Admin section.

The CRUD permissions are assigned in a grid. An Admin user will see the particular tab when they have the "Read" permission assigned. The Create option allows the user to Create New items and also Clone current items. Delete allows users to remove the item permanently.

Update covers all other operations that changes the data. This includes a simple edit, as well as Activating/Deactivating. It also includes operations specific to certain data types, for example Blacklisting a Data Set or Withdrawing an Alert Notification are considered as Updates.

Privilege	Read <input checked="" type="checkbox"/> <input type="checkbox"/>	Create <input checked="" type="checkbox"/> <input type="checkbox"/>	Update <input checked="" type="checkbox"/> <input type="checkbox"/>	Delete <input checked="" type="checkbox"/> <input type="checkbox"/>
Statistics and Legends				
Statistic Definitions	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Statistic Summaries	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Statistic Summary Groups	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 84: Assigning CRUD operations to Admin Tabs

To help select options there are "Select All" and "Deselect All" options available for both columns and rows.

NOTE: People can only be assigned to a single Security Role. If a person is assigned a new role from this screen, they will be reassigned from their current security role.

4.7.3 View Groups

View groups are groups assigned to WebPortal users, allowing the members of the group to override Global Settings or create new Settings of their own. Any user can be assigned to a single View Group, and there is no limit to how many users a View Group can have.

Clicking on the 'Overview' action of a View Group displays information about the Group, and a list of uncollected settings for various parts of the system. These Settings consist of the Global Settings, and the Settings created for the current View Group. The displayed Global Settings can be overridden, creating a new View Group Setting with a new Description and Value in place of the Global Setting.

View Group settings follow the same rules as Global Settings. View Group data is unvalidated, and the Setting Group and Setting Key cannot be modified once created. See section 4.9.1 for more information on Global, View Group and Account Setting properties.

Setting Group	Setting Key	Setting Value	Description	Setting Type	System	Actions
WebPortal	Test		Test View	View Group	✘	Edit
WebPortal	HiddenGlobalSettings	AQIS	Global Settings filtered out of list	View Group	✘	Edit
WebPortal	AppTitle	AQUARIUS WebPortal	Title of the WebPortal displayed in the Browser Title Bar	Global	✓	Override
WebPortal	LogoURL	http://www.aquaticinformatics.com/	Hyperlink when clicking on the WebPortal logo in the top-left corner.	Global	✓	Override
WebPortal.Controls.CompositeChart	Display	true	Whether the Composite Charts selector is displayed to users. Without the selector users are unable to view any composite charts that may have been defined. (Value: true false)	Global	✓	Override

Figure 85: View Group Overview

A View Group can be edited by clicking on the ‘Edit View Group’ button on the View Group overview page. This allows a user to change the Identifier, Description and Members of the View Group. View Group membership can also be set for individual People from the People tab.

Against the View Group there is the option to allow the View Group User’s access to all Locations. Alternatively a Folder or set of Folders can be added to the User, this filters the list of Locations the View Groups User’s will see to be Locations that only exists within the Folders specified.

NOTE: Folder-based security can be setup to run against the Primary Hierarchy or can be run against a special WebPortal Security Secondary hierarchy.

There is also the ability to give the View Group User’s access to all Parameters or filter the list of Parameters the user has access to. This has the effect of filter the Time-Series as the View Group User will only be presented with Time-Series that have a Parameter on their list.

NOTE: If a User has been assigned to a View Group the Location and Parameter security is based on their View Group. If a User isn’t assigned to a View Group these properties can be set directly against the User.

4.7.3.1 Anonymous Users

An ‘Anonymous’ View Group will exist by default. This View Group contains the Settings for Anonymous users accessing the WebPortal. This group cannot be deleted and users can’t be added to this group, but Settings can be created or overwritten as they are for any other group.

The group can also be used to filter the Locations and Parameters that Anonymous Users have access to through the Full Access to all Locations and Full Access to all Parameters options.

4.7.4 Audit Logs

The Audit Logs tab displays a list of all actions that have been performed in the system. The Audit Log displays information about where an Action has been performed (e.g. Create, Deactivate, Send, etc.) against an Object (e.g. Location, Person) and the Person who performed the Action.

The Status field displays whether the Action has Succeeded or Failed. Failed actions will have the option to display the error message related to that action.

Where an error has occurring, the details of the error message sent to Aquatic Informatics Support may prove valuable in fixing the error.

Action	Object	User	Timestamp	Status	Actions
Create	Person	AQUARIUS User	2014/09/29 05:03	Succeeded	
Create	Person	AQUARIUS User	2014/09/29 05:02	Succeeded	
Create	Person	AQUARIUS User	2014/09/29 05:02	Succeeded	
Edit	Person	AQUARIUS User	2014/09/29 05:02	Succeeded	
Edit	Person	AQUARIUS User	2014/09/29 05:01	Succeeded	
Edit	Person	AQUARIUS User	2014/09/29 05:01	Succeeded	
Edit	Person	AQUARIUS User	2014/09/29 05:01	Succeeded	
Edit	Person	AQUARIUS User	2014/09/29 05:00	Succeeded	
Edit	Person	AQUARIUS User	2014/09/29 05:00	Succeeded	
Edit	Person	AQUARIUS User	2014/09/29 05:00	Succeeded	

Figure 86: Audit Logs Grid

4.8 Scripts and Extensions

The Scripts and Extensions tab is used to manager Scripts written by administrators that extend on the out-of-the-box functionality of AQUARIUS WebPortal as well as creating rules specific to organisational requirements.

4.8.1 Scripts

Different types of Scripts can be created which add additional functionality to the WebPortal. There are currently three different types of scripts supported by the WebPortal:

- **Common:** Any scripts can be created as common, these are used when other scripts need to reference a common script function
- **Alert Trigger:** Alert Trigger functions can be used to create custom Alert Trigger Function logic that can be used to trigger Alerts and send Notifications.
- **Info Request:** Information Request functions may be defined to extract a wide variety of information from AQUARIUS WebPortal and make available as plain text in response to incoming request via email or text message (SMS), which can be useful while working remotely including out of mobile-internet range. A typical usage would be to provide regional situation reports giving a summary of average rainfall, maximum rainfall intensities, flooded rivers etc. A user from the northwest region might SMS “sitrep nw” to a mailbox associated with the AQUARIUS WebPortal and receive a reply with the “situation report” providing the latest summary information for the northwest region.
- **Data Table:** Data Table scripts can be used to read Time-Series data or query the database for the purposes of display gridded data on a Dashboard.
- **State Calculation - Location:** State Calculation functions be defined for Locations using either the meta-data of a Location or the data for associated Data Set References.
- **State Calculation - Time-Series:** State Calculation functions may be defined for Time-Series Data Sets using either retrieved Time-Series data and/or associated meta-data. For example:
 - **Data Currency**
States of “Current”, “Overdue”, “No Data” or “Unclassified” could be computed for each time-series depending on the EndTime associated with the each Data Set and consideration of whether the data was from a real-time (Telemetry) or manual source. An example workflow for setting up a script-based calculation for Data Currency together with associated legends is provided in section 7.3.5.

- o **Data Trend**

States of “Falling”, “Steady”, “Rising”, “Rising Fast” or “Unclassified” could be computed for each river-level (stage) time-series depending on the tendency of latest measurements.

NOTE: Scripts are written in the AQUARIUS SupaScript language which is common to both AQUARIUS WebPortal and AQUARIUS Forecast.

For general information on using Scripting within the WebPortal see section 8.5.

For more specific details on each of the Script types see section 8.6.1.

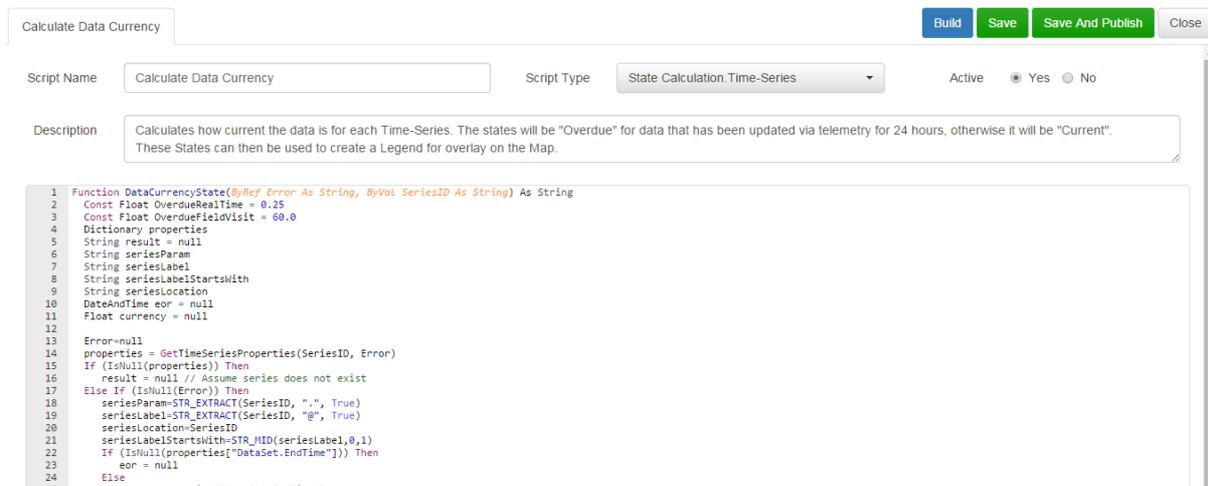


Figure 87: Script Data Entry Form

Figure 87 shows the start of a Script which calculates the “currency” of telemetry data. This example works by comparing the End of Record time for the Time-Series with the current time.

A Script should be built to test whether the edited Script on newly-created Script can compile and doesn’t affect other Scripts.

Timestamp	Message	Script Type	Script Name	Line	Column
1	Script Build - Started				
2	Retrieve scripts from database: 5 modules, 12 scripts found				
3	Building COMMON/Info Request Global Functions [1]				
4	Undefined symbol 'ReportFooter'	COMMON	Info Request Global Functions	9	5
5	Building COMMON/Test1 [2]				
6	Building ALERT/Test Alert [1]				
7	Building INFOREQUEST/SitRep [1]				
8	Symbol 'ReportFooter' not declared	INFOREQUEST	SitRep	19	20
9	Building INFOREQUEST/Help [3]				
10	Building INFOREQUEST/World [4]				
11	Building STATETIMESERIES/Calculate Data Currency [1]				
12	Script Build - Completed (Errors=2; Warnings=0)				

Figure 88: Build Log

The Build Log in the example Figure 88 shows two Errors and 10 Messages. Error messages indicates the build has failed. Clicking any of the Error messages will go directly to the Line and Column number of the Script.

Timestamp	Message	Script Type	Script Name	Line	Column
4	Undefined symbol 'ReportFooter'	COMMON	Info Request Global Functions	9	5
8	Symbol 'ReportFooter' not declared	INFOREQUEST	SitRep	19	20

Figure 89: Build Log – Errors Only

Clicking the Errors/Warnings/Messages buttons will show/hide the messages as in the example Figure 89.

When Building Scripts, changes to the current Script could affect other Scripts where there may be references to functions. Where a change to Scripts has caused errors with other Scripts, these Scripts appear in the right-side menu. The example Figure 90 shows the Info Request Global Functions script has been modified. This Script has errors but has also caused errors in the SitRep Script. Clicking any other these Scripts will open that Script in a new tab allowing editing of multiple Scripts together.

← Back to List
?
→

Scripts

Script Name	Modified
! Info Request Global Functions	!
! SitRep	

Build
Save
Save And Publish
Close

Active Yes No

Figure 90: Scripts with Errors

There are several options available in place of a standard 'Save' button:

- Build
 - Attempt to Compile the Script and displays the Build Log
- Save
 - Saves the Script and Exits
- Save and Publish
 - Saves the Script, attempts to Publish and Closes
 - If the Script compiles successfully it is published
 - If the Script doesn't compile it isn't published
- Close
 - Close without saving any changes

4.8.1.1 Script Build Order

Scripts written in the SupaScript language are compiled in a certain order. This order is important because a function cannot refer to a function in a Script that comes after it in the Build Order.

In the example Figure 91 if the “Help” Script contained a reference to the “SitRep” Script this would build. However if the “SitRep” Script contained a reference to the “Help” Script this would come up as an error.

Script Name		Function Count
+	SitRep	1
+	Help	1
+	World	1

Figure 91: Script Build Order

Each Type of Script can be re-ordered separately. Once Scripts have been re-ordered the Build button should be used to check the new order works correctly. This new order can then be Saved or Saved and Published.

4.8.1.2 Build and Publish

The List of Scripts shows the Last Updated and Last Published time of each Script. The Last Updated is when the Script was last edited by any user while the Last Published is when the entire set of scripts was last built and Published. This can help to show where changes have been made to the Scripts that haven't yet been published.

The “Build and Publish” button will attempt to Compile and then republish all active Scripts. If the compilation succeeds the Scripts will be published, otherwise the full Build Log is displayed.

4.9 Global Settings

The Global Settings tab displays a list of uncollected settings for various parts of the system. Global Settings are used by the WebPortal to control system functions. They can be overwritten by View Group Settings and Account Settings. See sections 3.2.3 and 4.7.3 for more information on Account Settings and View Group Settings respectively.

4.9.1 Global, View Group and Account Setting Properties

Data being entered into any of the Settings tables are completely un-validated. For this reason, users should be careful when making changes to values in the Global, View Group and Account Settings.

Each value will define the Data Type it expects, or Format it expects the data to be in. It will also define the default (if one has been set) and what the value is used for.

The default value is used in instances where the Setting Value doesn't exist, has been commented out (starts with a ';' semi-colon), or the Setting Value is not of the correct type. (e.g. a Boolean type expects 'true' or 'false' as the values, a value of nothing or 'yes' would fall back to the default value).

Settings have both a Setting Group for categorising the settings, and a Setting Key as a name. The description is solely for users to understand what the setting is for, and the Setting Value is the value of the setting. Once a Setting has been created, the Setting Group and Setting Key cannot be changed, as these are the two details that make up the Setting's unique name.

Each Global Setting has an option labelled "Setting Can Be Overridden" which is set to "Yes" by default. This allows the setting value to be overridden by View Group and Account Settings. Where this value has been set to "No", the setting will be Global and cannot be overridden, and will not appear in the View Group and Account Setting lists. All View Group Settings can be overridden by Account Settings.

When a Setting is overridden, the override Setting will be used in place of the original Setting. Override Settings can be edited in the same way as other Settings. Deleting an override Setting will revert the Setting back to how it was before overriding. For example, a View Group Setting will override a Global Setting. Deleting this View Group Setting will remove the override, and the original Global Setting will instead be used.

If an Override Setting's Value is left blank or invalid, the default value will be used. This means that an Override can be used to 'clear' a Setting value.

There are various workflows that can be performed by, adding, removing or changing Global Setting values. These and other workflows can be found in section 7.1

5 Other Sections

The three main sections of AQUARIUS WebPortal are the Data Section, Account Section and Admin Section. In addition there are two pages that can be accessed that display Status Information about AQUARIUS WebPortal and the components the system is accessing. Neither section is linked from the main WebPortal as both won't be accessed on a day-to-day basis, but can be used to diagnose issues in the event of a problem.

NOTE: These sections of AQUARIUS WebPortal can be accessed by anyone with the address, including users not Signed In to the system. This is to allow System Administrators and other IT support the ability to view and help resolve issues without requiring a WebPortal account.

5.1 Status Page

The Status Page has been designed to be viewed by support users as a quick non-holistic view of whether the AQUARIUS WebPortal has access to all the components it requires to display data, as well as whether new data is incoming and Statistics are being calculated.

This page can be accessed by navigating to “http<s>://<SERVER>/Status”.

Service Status

Code	Service Name	Status	Ping	Service Message	Actions
aqLicence	WebPortal Licence	✓	0 secs		
aqDatabase	WebPortal Database	✓	0.004 secs		
aqSyncAgent	WebPortal Sync Agent	✓	0.014 secs		
aqPublish	AQUARIUS Publish Service	✓	0.059 secs		
aqDataUpdate	AQUARIUS Data Update	—	0.007 secs	Last incoming data was 14 minutes and 36 seconds ago	
aqLatestStats	AQIS Latest Statistics Computation	—	0.004 secs	Latest Statistic cycle started 1 minutes and 13 seconds ago	
aqPeriodicStats	AQIS Periodic Statistics Computation	—	0.005 secs	Periodic Statistic cycle started 7 seconds and 192 milliseconds ago	
aqNotifications	AQIS Notifications Queue	—	0.021 secs	No notifications in the queue	
aqDataSync	AQIS Data Synchronisation	—	0.005 secs	Data Sync last cycle completed 9 minutes and 31 seconds ago	

Figure 92: Status Page

There are two kinds of Status message displayed

1. Pass/Fail: These status' will either display a green tick or a red cross in the 'Status' column. When there is a problem they will include an error message in the 'Service Message' column.
2. Informational: These will display a dash in the 'Status' column. The 'Service Message' displays relevant information which may indicate a problem depending on the WebPortal's configuration.

Informational status' can be changed into pass/fail by adding tolerances. Refer to section 7.2.10 "Configure Status Page" for more information.

5.2 Licence Status Page

The Licence Page has been designed as a status page for the Licence being run against the WebPortal. It is designed as a quick view of whether the current WebPortal is licensed and how much of the WebPortal Licence has been used. For details such as the expiry date, please use the Licence Manager application.

The Licence Status Page can be accessed by navigating to "http<s>://<SERVER>/Licence".

The Licence Status page show the Licence State in the top-left corner, if this says 'Valid', the WebPortal is licensed. The Licence Status page also shows how many items the WebPortal is allowed to have (Pool Size), how many spaces have been used (Pool Used), how many inactive items there are (Pool Inactive), what Tolerance is set on the free spaces (Pool Tolerance) and how many spaces are still free (Pool Free).

Green ticks indicate there is space free in the pool, blue exclamation marks indicate the pool is at or has gone below the Tolerance and red crosses indicate the pool has gone negative and the licence is Exceeded.

Licence Status

Licence State: Valid								Refresh All	Share	Info
Licence Feature	Type	Status	Pool Size	Pool Used	Pool Inactive	Pool Tolerance	Pool Free	Actions		
Alerting	-	✓	Unlimited	738	15	N/A	Unlimited	↻		
Locations	-	✓	5000	609	N/A	N/A	4391	↻		
⊖ Statistics	Latest (4)	✗	2 (Each)	7	0	N/A	1	↻		
Statistics	HG	✓	2	1	0	N/A	1			
Statistics	PP	✓	2	2	0	N/A	0			
Statistics	ResLevel_AHD	✗	2	3	0	N/A	-1			
Statistics	TideLevel_AHD	✓	2	1	0	N/A	1			
⊕ Statistics	Periodic (3)	✓	2 (Each)	3	2	N/A	3	↻		
Users + Anonymous	-	!	1000	992 (902 + 90)	0	10	8	↻		

Figure 93: Licence Status Page

Scripts and Statistics are licensed by Type. Without the enhanced option the details are hidden and must be expanded with the (+). The example in Figure 93 shows the Latest Statistics has been expanded and the four different Parameters being used. While the Periodic Statistics is collapsed.

The Alerts in the example above are Unlimited while the number of Users is below the tolerance (8 free spaces under a tolerance of 10).

The Statistics (Latest) has a breach indicated by the red 'X', drilling down shows that there are three Latest Statistics for Reservoir Level AHD which exceeds the basic limit of two. The breach can easily be resolved by deactivating a Latest Statistic Definition against Reservoir Level or by upgrading the WebPortal's Licence to have Unlimited Statistics.

6 Email and Text Message (SMS) Commands

AQUARIUS WebPortal can receive commands via emails or text messages (SMS) that enable people working remotely to affect changes in the WebPortal or receive information.

WebPortal defined Info Requests can all be accessed remotely and well as a set of built-in commands.

Emails should be directed to the email address used to send Notifications and text messages (SMS) should be sent to the mobile-phone number assigned by the external service provider.

NOTE: Emails and text messages (SMS) may not have been enabled on your system

Commands can be sent by anyone who knows the correct email address or mobile phone number. The WebPortal however is required to find the user in the list of People in the System. The person is found by directly matching either the email address or mobile phone number to the details of a Person in the system. If a command is sent by someone who is not found within the system, it will be ignored.

6.1 Info Requests

The list of available Info Requests are shown in the Reports tab of the Data Section, they are listed in a drop-down list in the control bar.

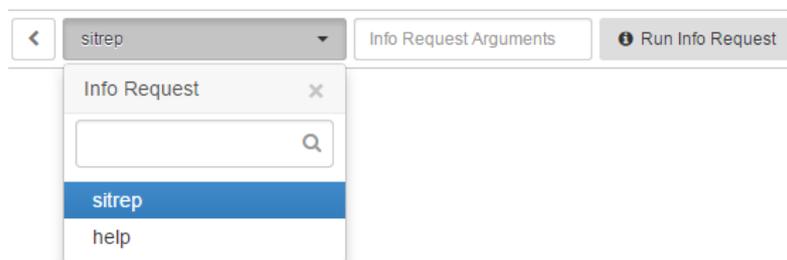


Figure 94: List of available Info Requests

NOTE: Info Requests are created by System Administrators, they will differ from system to system. This section of the User Manual displays examples as a guide only.

The Info Requests can be requested by sending the code in an email or text message (SMS). In the example Figure 94 the command “sitrep” or “help” can be used to request information.

By sending a message of “sitrep” a message will be returned as below:

```
[INFO:sitrep] Sitrep message goes here
```

Some Info Requests require additional arguments in order to be run. An example of this could be a “getlatest” Info Request that returns the Last Measurement recorded for a Time-Series.

“getlatest Stage.E1555@540132” could return:

```
[INFO:getlatest] Stage.E1555@540132 latest measurement was 0.17m @  
12:05 2015/04/17
```

NOTE: Info Requests can only contain additional arguments when the Enhanced Scripting is a Licensed component of the WebPortal.

Info Requests that require arguments, but are missing them, or don’t have enough arguments will not be run. An Info Request with insufficient arguments will send a reply back to the user saying their command has failed.

6.2 Built-In Commands

AQUARIUS WebPortal has a set of built-in commands that allow the ability to perform certain tasks remotely. These commands will always start with a ‘*’ so as to avoid clashes with user-created Info Requests.

Information on all the available commands is detailed in Table 4 below.

Commands	Command Function
*cancel	Cancels an Alert Notification. This command needs the number of the Alert Notification being cancelled as an argument.
*withdraw	See *cancel

Table 4: Built-In Email and Text Message (SMS) Commands

Built-in commands are able to perform tasks usually only performed by Administrators. These commands will only work for People who are in the System as Users and have an assigned Security Role.

6.3 Failed Commands

There are many reasons a command might fail upon being received by the WebPortal. The command may not exist, the command may require arguments not supplied, the user may not be authorised, etc. AQUARIUS WebPortal can optionally send back messages for failed requests. If a message isn’t received in reply, it is likely a failed command with acknowledgement turned off.

These are two examples of messages received for failed commands:

This is an automated message sent from the AQUARIUS WebPortal Notification System.

Your command "**COMMAND**" sent on 17/4/2015 at 12:26:22 PM has failed.

OR

This is an automated message sent from the AQUARIUS WebPortal Notification System.

Your command "**COMMAND**" sent on 17/4/2015 at 12:24:16 PM was not authorised and has been denied.

7 Workflows and Configuration Tasks

This section provides examples of some typical workflows and configurations tasks. It is a useful guide to assist those new to the system in gaining familiarity.

7.1 Configuration Tasks

The configuration tasks listed in this section can be done by users and Administrator users. For standard users the tasks are performed in the Account section against your Account Settings. For Administrators these tasks can be performed against the Global Settings to make the changes apply for all users.

7.1.1 Change the Map Centre

The map centre will be expressed in either Latitude and Longitude or Eastings and Northings depending on your map configuration. The centre value and zoom value can be set in your Settings.

- i. *Navigate to your Settings and filter the Setting Group by "Map"*
- ii. *Locate the "WebPortal.Map.Settings" "Main" setting and click Edit*
- iii. *At the top of the Setting value will be a "center: [0,0]" or similar*
 - . **Latitude/Longitude:** *Replace these values with the Longitude first, then Latitude of your map centre (e.g. [152.607, -27.402])*
 - . **Easting/Northing:** *Replace these values with the Easting first, then the Northing of your map centre (e.g. [498578.98, 6960261.13])*
- iv. *Set the zoom level found underneath to an appropriate value.*
- v. *Save the Setting and return to the Map to test the changes*

NOTE: Setting the zoom level may require a few tries and some guess work. A large city is a zoom level around 9 while a country the size of Australia or the U.S.A. would be around 4.

Setting Value

```
activeBaseMapGroup: "DefaultMaps",
center: [0,0],
zoom: 2,
autoResize: true,
```

Figure 95: Map Centre and Zoom Level

More general information about the Map settings is found in the technical reference, see section 8.12 for more information.

7.1.2 Change the Default Map

The WebPortal allows for easy switching between base maps by anyone using the system. By default the Open Street Map option will be displayed when opening up the Data Section of the WebPortal. This default can be changed to any other base map specified.

- i. *Navigate to your Settings and filter the Setting Group by “Map”*
- ii. *Locate the “WebPortal.Map.BaseMapGroup” “DefaultMaps” and click Edit*
- iii. *The groups is made up of many layers, one of which will have “isDefault: true”*
- iv. *Find the current default layer and remove the “isDefault” option*
- v. *Find the layer you wish to make the default and set “isDefault: true” against the layer*
- vi. *Save the Setting and return to the Map to test the changes*

Setting Value

```
{
  isDefault: true,
  title: "Satellite Imagery",
  description: "Satellite Imagery (ArcGIS)",
  thumbnail: "/Content/esri/satellite.jpg",
}
```

Figure 96: Setting Default Basemap

More general information about the Map settings is found in the technical reference, see section 8.12 for more information.

7.1.3 Change the Footer

The WebPortal displays a three line footer in the left-side navigation panel. These three lines can be configured through three different Settings.

- i. *Navigate to your Settings and filter the Setting Group by “Footer”*
- ii. *The first line of the footer is the current time, the can be switched off by opening the “WebPortal.Footer” “DisplayTime” and setting a value of “false”*
- iii. *The second line is usually the product name, this can be set by opening the “WebPortal.Footer” “ProductName” setting. The special word “[VERSION]” can be used to insert the current version number in the line*
- iv. *The third line is usually a copyright, this can be set by opening the “WebPortal.Footer” “Copyright” setting. The special word “[YEAR]” can be used to insert the current year and “©” is the HTML code for the copyright symbol.*
- v. *Make changes to any of the settings, save them and return to the Data Section to see the changes*

NOTE: HTML Code and Icons can be used in the text above. There is more information on using the codes and icons in the technical reference, see sections 8.9 and 8.10.

7.1.4 Change the Default Parameter

By default the WebPortal selects the first Parameter in the list to display initially. This can be changed to something more useful or more commonly used.

- i. *Navigate to your Settings and filter the Setting Group with “WebPortal.Controls”*
- ii. *Open the Setting “WebPortal.Controls.Parameters” “Default”*
- iii. *Beside Setting Value, type “Stage” (or another Parameter Identifier)*
- iv. *Click “Save”.*
- v. *Navigate back to the Data section to confirm this has worked.*

NOTE: The default value can be multiple Parameters if required. To use multiple Parameters separate each with a colon. Example “Stage, Res Level, Tide Level”

7.1.5 Configure Data Section display options

The tabs displayed in the Data Section and the order in which they are shown can be configured. By changing the order this can change your effective WebPortal home page (which is the Map by default). The process for configuring Tabs is as follows:

- i. *Navigate to your Settings and filter by “WebPortal.Display”*
- ii. *Select either WebPortal.Display/Tabs to edit the order for desktop WebPortal or WebPortal.Display/TabsMobile to edit the order for Mobile devices*
- iii. *Click the Edit Button*
- iv. *Change the list order and remove any tabs not being used*
- v. *Click Save*

The example below shows where the “Statistics” tab has been put first making it the effective home page.

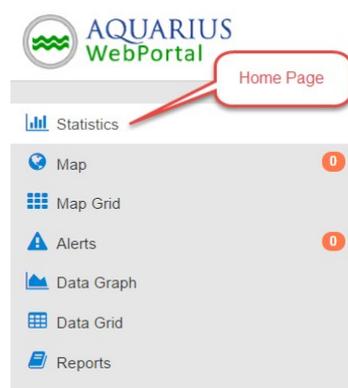


Figure 97: Modifying Data Section Tab Ordering

7.2 Administrator Configuration Tasks

The configuration tasks listed in this section must be done by a user who is Signed In as an Administrator. Most of the tasks involve editing Global Setting values.

7.2.1 Initial Configuration Tasks and Workflows

After your WebPortal has been installed there are some initial configuration tasks that could be done to help brand the WebPortal and set it up to your organisation's requirements:

Configuration Task	Section
Sign In	7.2.2
Change the Administrator Password	7.2.3
Change the Map Centre	7.1.1
Change the Default Base Map	7.1.2
Change the Default Parameter	7.1.4
Change the Tab Order and Home Page	7.1.5
Change the Footer	7.1.3
Add a Disclaimer	7.2.3
Change the WebPortal Logo and URL	7.2.6

Table 5: Initial Configuration Tasks

After doing some of the initial configuration to your WebPortal you'll want to get some data displaying on the Maps and Grids. The following workflows are designed to help your get started.

Workflow	Section
Add Numbers to the Map Indicators	7.3.1
Creating Info Requests	7.3.2
Create Legend based on Values	7.3.3
Create Legend for States based on Parameter Ranges (e.g.: Flood Levels)	7.3.4
Create Legend for Calculated State Values	7.3.5

Table 6: Initial Workflows

7.2.2 Sign In to the Admin Section

Click on the "Sign In" button in the top right. Confirm you can Sign In to the Admin section. The default Administrator account to use is: **admin/admin**. We recommend you change this admin password on your first Sign In, see section 7.2.3.

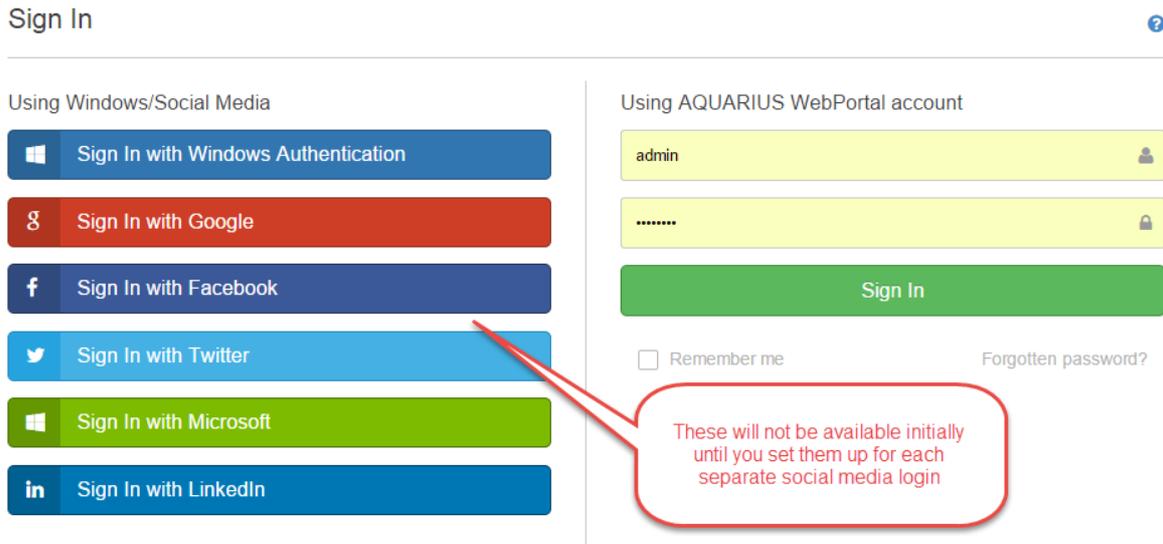


Figure 98: Sign In Options

You will not be able to Sign In with Windows Authentication or Social Media until you have created an account.

7.2.3 Change the Administrator's Password

After initial Sign In, with the Administrator's account, the password should be changed.

- i. Navigate to the Account section by clicking on "Administrator" and then "Manage Account" in the drop-down menu*
- ii. In the left-side navigation panel select Change Password*
- iii. Type the current password in the first field*
- iv. Type the new password in the next two fields, the password must be at least eight characters long and contain at least one number and one special character (e.g. !@\$*)*
- v. Press the Change Password button to set the new password*
- vi. Sign Out of the WebPortal and sign back in to test the new password*

NOTE: If you have forgotten the password the System Administrator is able to restore is back to 'admin', details are in the System Administrator Guide.

7.2.4 Add a Popup Disclaimer

A Popup Disclaimer can be configured which appears when a client first loads the WebPortal.

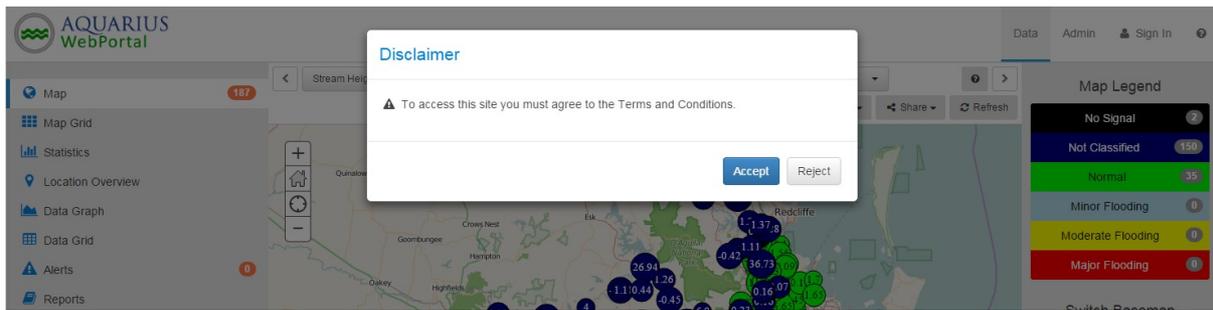


Figure 99: Disclaimer Message

Disclaimers can be configured by making changes to seven Global Settings in the Setting Group “WebPortal.Display”.

- i. *Click on Admin*
- ii. *Click on Global Settings*
- iii. *Filter by “Disclaimer”*
- iv. *Edit the “Text” Global Setting*
- v. *Set the disclaimer message in the text.*
- vi. *Click Save*
- vii. *Edit the “Enabled” Global Setting*
- viii. *Set the value to “true” and Click Save*

This will create a simple Disclaimer message that can be either Accepted or Rejected.

Rejecting the disclaimer will take the user to a Disclaimer rejected page. An additional custom message can be added to this page with the “WebPortal.Pages” “DisclaimerRejected” Global Setting.

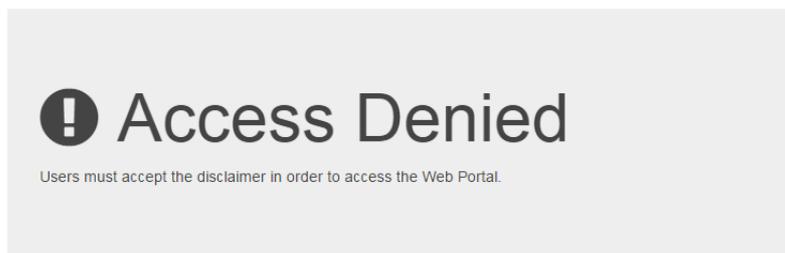


Figure 100: Disclaimer Rejected Message

Additional display options can be configured through other Global Settings in the “WebPortal.Disclaimer” group.

- The “Accept” and “Reject” settings allow you to change the text for the buttons.
- The “Title” setting allows you to change the Disclaimer popup title which says “Disclaimer” by default.
- The “RejectButtonEnabled” setting allows you to remove the Reject button option.

- The “Redirect” option allows you to set a URL where the user is redirected when rejecting the Disclaimer.

NOTE: Disclaimer text can be written in HTML. This allows standard HTML styles and Codes to be used as well as Icons.

More information on HTML codes can be found in section 8.9, more information about using Icons can be found in section 8.10.

7.2.5 Add an Announcement Banner

An Announcement Banner can be added into the blank space in the Navigation menu. This will be seen by all users across all sections of the WebPortal and is useful for broadcasting important system announcements.



Figure 101: Sample Announcement Banners

- i. Click on Admin
- ii. Click on Global Settings
- iii. Click “Add New Global Setting” button
- iv. In “Setting Group” field, type: WebPortal.Announcement
- v. In “Setting Key” field, type: info
- vi. You have the option to type a description.
- vii. In the Setting Value, type the announcement you want to have displayed as a blue banner across the WebPortal.
- viii. Refresh your browser (F5) to display the banner

The resulting banner will be a blue, to add an announcement banner of a different colour, use the Setting Keys found in Table 7.

Setting Key	Message Display
success	Green Message
info	Blue Message
warning	Yellow Message
danger	Red Message

Table 7: Announcement Banner Setting Keys

Only one announcement can be displayed at any time. If multiple announcements have been added the most important will be displayed. For example “danger” is more important than “info”, a Red announcement would be displayed instead of Blue announcement.

NOTE: Symbols and Icons can also be included in Announcement Banners. Details for standard HTML symbols are found in section 8.9 and Icons found in section 8.10.

To remove Announcements from the WebPortal simply delete the Global Setting value.

7.2.6 Change the WebPortal Logo and URL

The WebPortal logo by default links to the Aquatic Informatics home page, this can be changed through Global Settings

- i. *Navigate to the Global Settings*
- ii. *Filter the Setting Key by “Logo”*
- iii. *Click to Edit the Global Setting “WebPortal” “LogoURL”*
- iv. *Change the Setting value to a URL of your choice, to remove stop the Logo from linking, set the value to nothing.*
- v. *Save the value and go to the Data Section to verify the changes*

NOTE: The WebPortal Logo can be change by the System Administrator, details are in the System Administrator Guide. Two images are required, a logo (maximum size 50x300 pixels) and an icon (maximum size 50x50 pixels), with examples below.



Figure 102: Logo Example



Figure 103: Icon Example

Configure Email and Text Message (SMS) Command System

To allow your system to send notifications as well as send and receive email and text message (SMS) commands, the notifications system must be configured with an email account. This is done by configuring some Global Settings values.

Any mail provider that uses SMTP and IMAP or Microsoft Exchange Server can be used for sending and receiving emails. A System Administrator will need to set up a mailbox outside of the WebPortal. Details are in the Install Guide and System Administration Manual.

Text Messages (SMS) can be sent via email through a third party subscription service.

7.2.7.1 Change Global Settings

To send notifications via email, the Global Settings will need to be configured. The settings all have the “AQIS.Email” Setting Group as a parent.

Setting Group ▲	Setting Key	Setting Value	Description	Can O...	System	Actions
AQIS.Email	Username		The username of the account being used for incoming and outgoing emails.	✘	✔	Edit
AQIS.Email	Password		The password of the account being used for incoming and outgoing emails. This value must be encrypted using AQUARIUS Utility.	✘	✔	Edit
AQIS.Email	UseExchange	true	Whether to use a direct connection to Microsoft Exchange for emails or a combination of SMTP and IMAP (Values: true, false)	✘	✔	Edit
AQIS.Email.Exchange	Server		The server address of the Microsoft Exchange server.	✘	✔	Edit
AQIS.Email.Exchange	Domain		The optional domain of the account on the server.	✘	✔	Edit
AQIS.Email.Exchange	Type		The Microsoft Exchange server version, for Office365 this should be Exchange2013. (Values: Exchange2007_SP1, Exchange2010, Exchange2010_SP1, Exchange2010_SP2, Exchange2013)	✘	✔	Edit
AQIS.Email.Incoming	Server		The server address of the IMAP or POP3 server.	✘	✔	Edit
AQIS.Email.Incoming	Port		The port number used to communicate with the IMAP or POP3 server.	✘	✔	Edit
AQIS.Email.Incoming	Security	TLS	Whether to use SSL, TLS or no security on the connection to the IMAP or POP3 server.	✘	✔	Edit
AQIS.Email.Incoming	Type	IMAP	Whether to use IMAP or POP3 for incoming emails.	✘	✔	Edit
AQIS.Email.Outgoing	Server		The server address of the SMTP server.	✘	✔	Edit
AQIS.Email.Outgoing	Port		The port number used to communicate with the SMTP server.	✘	✔	Edit
AQIS.Email.Outgoing	Security	TLS	Whether to use SSL, TLS or no security on the connection to the SMTP server.	✘	✔	Edit

Figure 104: Global Settings for Email Notifications

Setting Group	Setting Key	Description
AQIS.Email	Username	The username/email address of the account on the server to be used for AQIS notifications.
AQIS.Email	Password	The password of the account on the server to be used for AQIS notifications. This is an encrypted value using the AQUARIUS Utility.
AQIS.Email	UseExchange	Set to 'true' when an Exchange Server is to be used.
AQIS.Email.Exchange	Type	For Microsoft Exchange, this value can be one of the following: Exchange2007_SP1, Exchange2010, Exchange2010_SP1, Exchange2010_SP2 or Exchange2013
AQIS.Email.Exchange	Server	The fully qualified DNS name (not a URL) of the email server.
AQIS.Email.Exchange	Domain	The optional domain of the account on the server. This field should be empty if a full email address is specified for the username
AQIS.Email.Incoming	Type	The protocol to use for incoming emails. Use "IMAP" for this field.
AQIS.Email.Incoming	Server	The server address of the IMAP server.
AQIS.Email.Incoming	Port	The port number used to communicate with the IMAP or POP3 server. (Example Values: 110, 143, 993, 995, 1110, 2221)
AQIS.Email.Incoming	Security	Whether to use SSL, TLS or no security on the connection to the IMAP server. (Values: None, SSL, TLS, Auto)
AQIS.Email.Outgoing	Server	The server address of the SMTP server.
AQIS.Email.Outgoing	Port	The port number used to communicate with the SMTP server. (Example Values: 25, 465, 587).
AQIS.Email.Outgoing	Security	Whether to use SSL, TLS or no security on the connection to the SMTP server. (Values: None, SSL, TLS, Auto)

Table 8: Email Notification Settings

The process for setting up email notifications is as follows:

- i. *Click on Admin*
- ii. *Click on Global Settings*
- iii. *Filter by Setting Group: "AQIS.Email"*
- iv. *In "Username" Setting Key field, type the username of the mailbox setup (e.g. "username" only for Exchange servers or the entire email address for other providers).*
- v. *In "Password" Setting Key field, paste the encrypted password that was encrypted using AQUARIUS Utility.*

The rest of the settings are specific to whether you are connecting via SMTP/IMAP or via a direct connection to the Microsoft Exchange server.

7.2.7.1.2 SMTP and IMAP

When using an IMAP and SMTP Server, using the following steps. Each of these settings will be in the “AQIS.Email.Incoming” and “AQIS.Email.Outgoing” groups. The values required can usually be provided by the Email Provider used (e.g. Office 365, Gmail, Yahoo!).

- vi. *In the “Server” Setting Key field of the Outgoing settings, type the address of the SMTP Server.*
- i. *In the “Port” Setting Key field of the Outgoing settings, type the Port of the SMTP Server.*
- ii. *In the “Security” Setting Key field of the Outgoing settings, type the required connection security of the SMTP Server. Some providers will not allow ‘None’ to be selected. If ‘Auto’ is chosen, AQIS will attempt to determine whether a TLS or SSL connection should be used.*
- iii. *In the “Type” Setting Key field of the Incoming settings, ensure the value of ‘IMAP’ is used. POP3 does not have the capabilities required by AQIS.*
- iv. *In the “Server” Setting Key field of the Incoming settings, type the address of the IMAP Server.*
- v. *In the “Port” Setting Key field of the Incoming settings, type the Port of the IMAP Server.*
- vi. *In the “Security” Setting Key field of the Incoming settings, type the required connection security of the IMAP Server. Some providers will not allow ‘None’ to be selected. If ‘Auto’ is chosen, AQIS will attempt to determine whether a TLS or SSL connection should be used.*

7.2.7.1.3 Exchange Server Direct Connection

When using an Exchange Server, using the following steps. Each of these settings will be in the “AQIS.Email.Exchange” group.

NOTE: The Exchange Server Direction Connection will be deprecated in a future version of AQUARIUS WebPortal. It is recommended that standard protocols of SMTP and IMAP are used.

- i. *In “Domain” Setting Key field, type the Active Directory server address (e.g. “ad.domain.com” for Exchange servers. For Office 365, leave the setting key field blank).*
- ii. *In “Type” Setting Key field, type the version of Exchange server hosting the mailbox. This value can be one of the following: Exchange2007_SP1, Exchange2010, Exchange2010_SP1, Exchange2010_SP2 or Exchange2013. For Office 365 with Exchange, use: “Exchange2013”.*
- iii. *In “Server” Setting Key field, type the fully qualified DNS name (not a URL) of the email server. For Office 365, use: “outlook.office365.com”.*

7.2.7.2 Sending a Manual Test Notification

Manual Notification can be created in the WebPortal to send a simple one-time Notification to Users, Distribution Group. To send a manual Notification:

- i. *Click on Alerting and Notifications*
- ii. *Click on Notifications*
- iii. *Click “Send Manual Notification” button in top left corner*
- iv. *Type a sample message in the ‘Message’ field*

- v. Type an email address in the “Email addresses” field or select your name from the Users drop-down menu to send to yourself or others that have valid email addresses in the system.
- vi. Click “Send” to send a Test email
- vii. Once the notification has been sent, the X value in the “Done” column will change to a checkmark (you can refresh the page in the lower right corner)
- viii. Once you receive the test email, this completes the workflow.

7.2.7.3 Text Messages (SMS)

AQUARIUS WebPortal can be configured to send Notifications as Text Messages (SMS) by using a third-party SMS gateway. This works by sending an email to a designated Email-to-SMS provider containing the mobile phone number and message to send.

The exact method of configuring the Email to SMS settings will vary between providers, so the following instructions should be followed in accordance to the instructions provided by the Email-to-SMS provider used.

AQUARIUS WebPortal requires a single Global Setting to enable the Test Messaging of Alerts. The system must be set up to send email Alerts in order to send any emails to the provider. To set the Global Setting, the following instructions can be used:

- i. Confirm the Mailbox and Email Settings has been setup as above
- ii. Click on Admin
- iii. Click on Global Settings
- iv. Filter by Setting Group: “AQIS.Notifications.SMS” and edit the setting with the Key “EmailFormat”.
- v. In the Setting Value, set the email format to the format supplied by the service provider. The standard convention is displayed below, where the “Provider Domain” is supplied by the provider:

[Phone Number]@[Provider Domain]

- vi. Replace the phone number placeholder with “{0}”. Since the phone number will be different for each alert, this symbol represents the location where the phone number will be used.

Once the Global Setting has been saved a Manual Notification can be sent to test the text message system.

7.2.8 Configure Reports

Reports in AQUARIUS WebPortal are published reports which have been synchronised in from AQUARIUS Time-Series. While the synchronisation between AQUARIUS Time-Series and WebPortal is an automatic process, publication of reports must be set up first.

NOTE: Report publication will need to be done by a System Administrator on the AQUARIUS server machine

1. Chose some Reports to publish, these will be either Report Definitions or Report Templates in AQUARIUS.
2. Chose a name for the Reports being published. WebPortal Reports can be created into a hierarchy by using a dot-notation in the name. For example in Figure 105 the “Overdue Sensors” report would have a name of “Operations.Issues.Overdue Sensors”, with each dot denoting a folder.
3. Provide the details of the Report Templates and Definitions as well as the names being assigned to them to your System Administrator. Note that you will need to distinguish between Templates and Definitions.

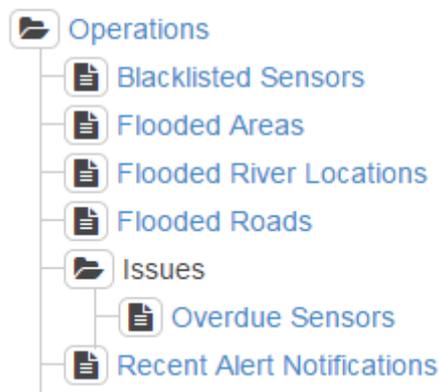


Figure 105: Example Report tree structure

7.2.9 Configure WebPortal Security

WebPortal security is initially based on the Primary Hierarchy within AQUARIUS.

Within Global Settings the Setting Group “WebPortal.Security”, Setting Key “PrimaryFolders” can be changed to a value of “false” which allows Secondary Folders to be used for Security. Using Secondary Folders allows for Locations to be in multiple Folders offering more flexibility with how Security is defined.

In order to use Secondary Folder security the folder structure must exist in AQUARIUS. There are example SQL scripts that can be run by your System Administrator. These are located in the *AQUARIUS WebPortal System Administration Guide*.

7.2.10 Configure Status Page

The Status page has options available for configuration including hiding unused Statuses and setting Tolerances on Statuses. These are done through Global Settings.

7.2.10.1 Display

Some Statuses may not be relevant to the setup of a particular WebPortal install. Statuses can be removed from the List of returned Statuses and the Status page through a Global Setting value.

To remove a Status from the list, edit the equivalent Global Setting with the Setting Group:

Setting Group: WebPortal.Status.Display

The Setting Key is the Code for the Status being hidden.

Set the value to “False” and the Status code won’t appear in the List, set the value to “True” and the Status code will appear in the list. These Statuses are also removed from the machine-readable lists and therefore won’t be included in automated tests.

7.2.10.2 Tolerances

Informational Statuses can be turned into Pass/Fail type Statuses by adding a Tolerance. A Tolerance checks whether the timeout of the message has been exceeded. Exceeding the timeout makes the Status fail while if the timeout isn’t exceeded the Status check is passed.

As an example the ‘aqLatestStats’ Status displays a message of when the Latest Statistics calculation cycle was last started (the timeout). By adding a Tolerance of 10 minutes the Status check will Pass while the last cycle was started within the last 10 minutes and Fail if the cycle was last started more than 10 minutes ago.

Tolerances can be found in the Global Settings with the Setting Group:

Setting Group: WebPortal.Status.Tolerance

There is a Global Setting for each of the Informational Statuses. To add a Tolerance, edit the appropriate Global Setting and set a value in seconds for the Tolerance. To remove a Tolerance, remove the value from the Setting Value and save.

7.2.10.3 Request Timeout

Statuses are tested individually with results usually returning in well under one second. Occasionally a Status may take longer to retrieve (usually when trying to communicate with an external system). To avoid having to wait a long time for a Status message to return there is a built-in Request Timeout.

After 30 seconds of attempting to get a Status the process will give up a return a Fail with a request timed out message.

This 30 seconds can be configured in the Global Settings with the Setting Group and Key:

Setting Group: WebPortal.Status

Setting Key: RequestTimeout

The number can be changed to any whole number which represents the number of seconds before the request times out. Removing the Setting Value or will result in the default value being used.

7.2.11 Configure Licence Page

Licence Features can be configured with a Tolerance which can flag Licence Features that are being used heavily and may need to be upgraded. These Licence Features can be picked up with external automated tests.

Tolerances are based on the “Pool Free” value. If the Pool Free value reaches or goes below the Tolerance, the Licence Feature will be marked with a blue Exclamation Mark instead of a green Tick.

Tolerances can be found in the Global Settings with the Setting Group:

Setting Group: WebPortal.Licence.Tolerance

There is a Global Setting for each of the Licence Features. To add a Tolerance, edit the appropriate Global Setting and set a value in number of items for the Tolerance. To remove a Tolerance, remove the value from the Setting Value and save.

7.2.12 Configure Authentication (Sign In) Options

AQUARIUS WebPortal has four different methods to allow users access to your system. Anonymous, Forms, Windows and Social. These methods can be assigned in any combination:

- **anonymous:** this is to allow the WebPortal to be public facing, therefore it will be accessible to everyone without having to Sign In.
- **forms:** this method allows users to Sign In using a username and password (from the Sign In page)
- **windows:** this method uses active directory authentication
- **social:** this method allows users to Sign In with a social media account (social media options must be configured separately, e.g. Microsoft, LinkedIn, Google, etc.)

Enabling and disabling different methods of authentication must be done by a System Administrator. Provide your System Administrator with the required methods of authentication using the words above (“anonymous”, “forms”, “windows”, “social”).

Social Media as a Sign In option must be configured separately in section 7.2.3, the next workflow.

7.2.13 Add Social Media Sign In Options

Each Social Media provider must be configured separately which involves registering your WebPortal with the Social Media provider and setting up Global Setting values.

NOTE: Social Media Sign In can be added to any public-facing AQUARIUS WebPortal install which uses a Domain Name, IP addresses are not allowed for security reasons

AQUARIUS WebPortal supports Google, Facebook, Twitter, Microsoft and LinkedIn as Social Media Sign In options.

NOTE: The instructions for setting up with each provider were current as of December 2014. The procedures may have been changed by the external providers.

The Terms and Conditions for using each provider as a Sign In method should be verified independently before being configured.

7.2.13.1 Google

Follow the steps below to configure Google as a Social Media sign in option:

7.2.13.1.1 Register with Google

- i. Sign In to your organisation's Google account*
- ii. Navigate to <https://console.developers.google.com/>*
- iii. Click "Create Project" and add a Project with the name "AQUARIUS WebPortal"*
- iv. Set the unique Project ID to "aqwebportal-[YOUR_ORGANISATION]" (e.g. aqwebportal-aquaticinformatics)*

(Note: this Project ID must be unique to all of Google not just your account)
- v. Click on "APIs & Auth" in the left-side menu and then click "APIs"*
- vi. Locate the "Google+ API" in the list and turn this On*
- vii. Click on "Consent screen" in the left-side menu*
- viii. Set the email address and Product Name (Note: if an error occurs when a user tries to sign in, this email will be given to them as a contact point)*
- ix. Set the Product Logo, the standard AQUARIUS WebPortal logo can be used, located here: <http://aquaticinformatics.com/wp-content/uploads/aquarius-webportal-icon.png>*
- x. Save the Consent Screen*
- xi. Click on "Credentials" in the left-side menu*
- xii. Under OAuth press "Create New Client ID"*
- xiii. Set Web application as the Application Type*
- xiv. Set the Authorised JavaScript Origins as your WebPortal's public address (e.g. <https://webportal.aquaticinformatics.com>)*
- xv. Set the Authorised Redirect URIs to the same address with "/signin-google" at the end (e.g. <https://webportal.aquaticinformatics.com/signin-google>)*
- xvi. When this is created you will have a screen with five details. The Client ID and Client Secret are the two important details required for the next step*

NOTE: Google allows for 10,000 sign in requests per day, after which payment is required. Usage can be seen through the Google Developers Console by navigating to "APIs" in the left-side menu, then "Google+ API" and clicking the Usage tab.

7.2.13.1.2 Add Global Settings

- i. *Navigate to the Global Settings tab in the Admin section*
- ii. *Click the “Add New Global Setting” button*
- iii. *Type “WebPortal.SocialSignIn.Google” as the Setting Group*
- iv. *Type “ClientID” as the Setting Key (case-sensitive)*
- v. *Add the Client ID as the Setting Value (this should be in the form of “[uniqueid].apps.googleusercontent.com”)*
- vi. *Save the Global Setting*
- vii. *Click the “Add New Global Setting” button*
- viii. *Type “WebPortal.SocialSignIn.Google” as the Setting Group*
- ix. *Type “ClientSecret” as the Setting Key*
- x. *Add the Client Secret as the Setting Value*

Verify that Google authentication works by associating your account with Google, Signing Out and clicking the Sign In with Google button.

7.2.13.2 Facebook

Follow the steps below to configure Facebook as a Social Media sign in option:

7.2.13.2.1 Register with Facebook

- i. *Sign In to your organisation’s Facebook account*
- ii. *Navigate to <https://developers.facebook.com/apps>*
- iii. *Click the “Register Now” button and accept the terms*
- iv. *You will need to verify your account as a Facebook developer, this will require a pin-number being sent to your mobile phone*
- v. *Select to add a “New App” of type “Website”*
- vi. *Type the name “AQUARIUS WebPortal” and press “Create New Facebook App ID”*
- vii. *Set the category to “Business” and Create the App*
- viii. *Set the Site URL as your Website’s public address (e.g. <https://webportal.aquaticinformatics.com/>) and press Next*
- ix. *Click the “Log in” button to add Facebook login details*
- x. *Click the Apps menu and select your Application to go through to the dashboard*
- xi. *Here you’ll find the App ID and App Secret which will be used in the steps below*

7.2.13.2.2 Add Global Settings

- i. *Navigate to the Global Settings tab in the Admin section*
- ii. *Click the “Add New Global Setting” button*
- iii. *Type “WebPortal.SocialSignIn.Facebook” as the Setting Group*
- iv. *Type “AppID” as the Setting Key (case-sensitive)*
- v. *Add the App ID as the Setting Value*
- vi. *Save the Global Setting*
- vii. *Click the “Add New Global Setting” button*

- viii. Type *“WebPortal.SocialSignIn.Facebook”* as the Setting Group
- ix. Type *“AppSecret”* as the Setting Key
- x. Add the App Secret as the Setting Value

Verify that Facebook authentication works by associating your account with Facebook, Signing Out and clicking the Sign In with Facebook button.

7.2.13.3 Twitter

Follow the steps below to configure Twitter as a Social Media sign in option:

7.2.13.3.1 Register with Twitter

- i. Sign In to your organisation’s Twitter account
- ii. Navigate to <https://apps.twitter.com/>
- iii. Type *“AQUARIUS WebPortal”* as the Name
- iv. Add a description
- v. Set the Website as your WebPortal’s public address (e.g. <https://webportal.aquaticinformatics.com/>)
- vi. Set the Callback URLs to the same address with *“/signin-twitter”* at the end (e.g. <https://webportal.aquaticinformatics.com/signin-twitter>)
- vii. Accept the Developer Agreement and click *“Create your Twitter Application”*
- viii. Click the *“Keys and Access Tokens”* tab, this will show you your Consumer Key and Secret which are needed for the next step

7.2.13.3.2 Add Global Settings

- i. Navigate to the Global Settings tab in the Admin section
- ii. Click the *“Add New Global Setting”* button
- iii. Type *“WebPortal.SocialSignIn.Twitter”* as the Setting Group
- iv. Type *“ConsumerKey”* as the Setting Key (case-sensitive)
- v. Add the Consumer Key as the Setting Value
- vi. Save the Global Setting
- vii. Click the *“Add New Global Setting”* button
- viii. Type *“WebPortal.SocialSignIn.Twitter”* as the Setting Group
- ix. Type *“ConsumerSecret”* as the Setting Key
- x. Add the Consumer Secret as the Setting Value

Verify that Twitter authentication works by associating your account with Twitter, Signing Out and clicking the Sign In with Twitter button.

7.2.13.4 Microsoft

Follow the steps below to configure Microsoft as a Social Media sign in option:

7.2.13.4.1 Register with Microsoft

- i. Sign In to your organisation’s Microsoft account
- ii. Navigate to <https://account.live.com/developers/applications>

- iii. Create a new Application called "AQUARIUS WebPortal"
- iv. Upload an image as the Application Logo
- v. Save the details and click to go to the "API Settings"
- vi. Set "No" for "Mobile or desktop client app"
- vii. Set "Yes" for "Restrict JWT issuing"
- viii. Set the Redirect URLs as your WebPortal's public address with "/signin-microsoft" at the end (e.g. <https://webportal.aquaticinformatics.com/signin-microsoft>)
- ix. Save the details and click to go to the "App Settings"
- x. A Client ID and Client Secret value will found on the App Settings page, these are needed for the next step

7.2.13.4.2 Add Global Settings

- i. Navigate to the Global Settings tab in the Admin section
- ii. Click the "Add New Global Setting" button
- iii. Type "WebPortal.SocialSignIn.Microsoft" as the Setting Group
- iv. Type "ClientID" as the Setting Key (case-sensitive)
- v. Add the Client ID as the Setting Value
- vi. Save the Global Setting
- vii. Click the "Add New Global Setting" button
- viii. Type "WebPortal.SocialSignIn.Microsoft" as the Setting Group
- ix. Type "ClientSecret" as the Setting Key
- x. Add the Client Secret as the Setting Value

Verify that Microsoft authentication works by associating your account with Microsoft, Signing Out and clicking the Sign In with Microsoft button.

7.2.13.5 LinkedIn

Follow the steps below to configure LinkedIn as a Social Media sign in option:

7.2.13.5.1 Register with LinkedIn

- i. Sign In to your organisation's LinkedIn account
- ii. Navigate to <https://developer.linkedin.com/>
- iii. In the top-right corner select API Keys from the drop-down menu under your username
- iv. Add a new Application called "AQUARIUS WebPortal"
- v. Fill in the all required details under the 'Company Info' and 'Application Info' section
- vi. In the OAuth User Agreement select 'r_basicprofile' and 'r_emailaddress'
- vii. Set the OAuth2 Redirect URLs as your WebPortal's public address with "/signin-linkedin" at the end (e.g. <https://webportal.aquaticinformatics.com/signin-linkedin>)
- viii. Agree to the Terms of Service and press 'Add Application'
- ix. An API Key and Secret Key value will provided to generated for you, these are needed for the next step

7.2.13.5.2 Add Global Settings

- i. *Navigate to the Global Settings tab in the Admin section*
- ii. *Click the “Add New Global Setting” button*
- iii. *Type “WebPortal.SocialSignIn.Linkedin” as the Setting Group (case-sensitive)*
- iv. *Type “APIKey” as the Setting Key (case-sensitive)*
- v. *Add the API Key as the Setting Value*
- vi. *Save the Global Setting*
- vii. *Click the “Add New Global Setting” button*
- viii. *Type “WebPortal.SocialSignIn.Linkedin” as the Setting Group*
- ix. *Type “SecretKey” as the Setting Key*
- x. *Add the Secret Key as the Setting Value*

Verify that LinkedIn authentication works by associating your account with LinkedIn, Signing Out and clicking the Sign In with LinkedIn button.

7.2.13.6 Removing Social Media Sign In

To remove any of the Social Media Sign In options, simply delete each of the associated Global Setting values. For example, to remove Facebook, remove all the Global Settings with the Setting Group of WebPortal.SocialSignIn.Facebook. The “Sign In With Facebook” icon will immediately disappear from the Sign In page.

7.2.13.7 Troubleshooting Social Media Sign In

When Social Media sign in options are configured they will appear on the Sign In page as per Figure 106. Clicking the link will either automatically Sign In the user, or redirect them to a page where they can enter their credentials.

Using Windows/Social Media

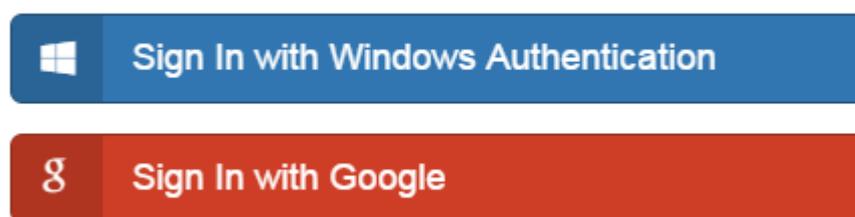


Figure 106: Social Media Sign In Options

If a Social Media sign in option has been configured, but the link isn't appearing on the Sign In page there are two possible issues.

1. The settings haven't been picked up by the WebPortal:
You may need to get your System Administrator to restart the WebPortal to pick up changes to these settings.

2. The settings have been added incorrectly:

Double check whether the Global Settings have been added correctly, for the Sign In option to display all Global Setting values must be present (they are also case-sensitive). Settings are different per-provider, for example Google uses ClientID while Facebook uses AppID as the Setting Key.

If any values have been entered incorrectly you will need to have your System Administrator restart the WebPortal for changes to take effect.

If a Social Media sign in option has been configured, the link is present, and clicking it returns you immediately back to the Sign In page with no error message, there is one possible issue.

1. The Global Setting values have been set incorrectly. Double check the values against what was provided making sure there are no leading or trailing spaces. You will need to have your System Administrator restart the WebPortal for changes to take effect.

If a Social Media sign in option has been configured, the link is present, but it takes you to an error screen from the sign in provider, there are two possible issues (note: the error page may contain information that helps identify the issue).



401. That's an error.

Error: invalid_client

The OAuth client was not found.

▸ Request Details

That's all we know.

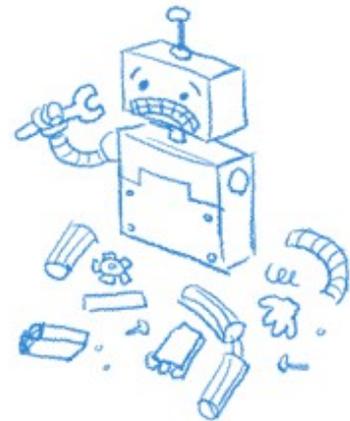


Figure 107: Example error screen from Google

1. The details in the Global Settings have been set incorrectly
Values copied across from your Social Media provider may be incorrect, check that the values are exactly as provided, without leading or trailing spaces. If they are

incorrect, re-enter the values and have your System Administrator restart the WebPortal for changes to take effect.

2. The details with the Social Media provider have been set incorrectly

Details provided to the Social Media provider may be incorrect, or required details may be missing. Check the specific procedure above and ensure you have completed all required steps and added all required information for your provider. If values were incorrectly entered with the Social Media provider, adjust them accordingly and test signing in again.

7.2.14 Configure System into Test Mode

“Test Mode” has been designed for a system that is being used for demonstration or User Acceptance Testing (UAT) purposes. It allows the system to run with the full set of real data, while avoiding sending Notifications from Alerts to real People.

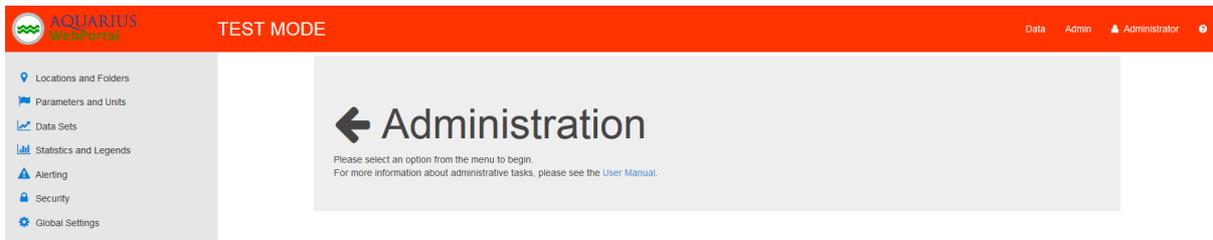


Figure 108: Test Mode enabled in Global Settings

When the AQUARIUS WebPortal system has been placed in the Test Mode, most areas of the system will continue to operate as-normal. The exceptions are some parts of the interface functionality, the Alerts being triggered and the subsequent Notifications being sent.

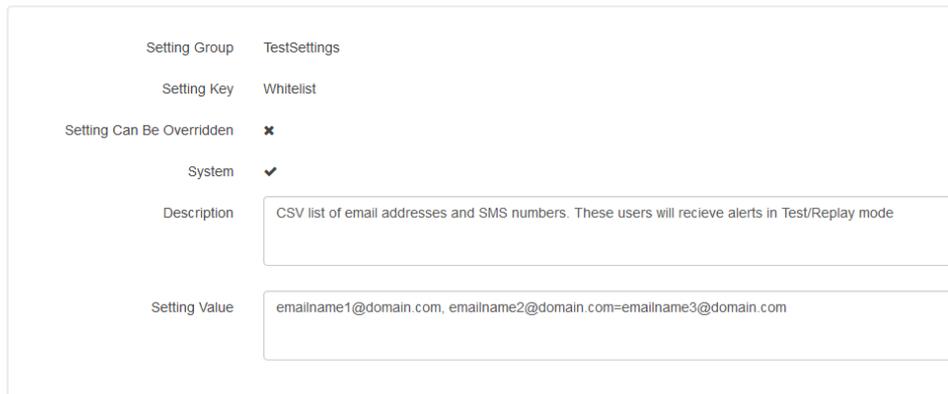
The Test Mode is set in Global Settings> TestSettings > Active> Setting Value. Type “true” in the Setting Value to place the system in Test Mode. This Boolean is “false” by default. The browser will need to be refreshed (Ctrl+F5) to activate.

Test Mode changes the style of the system by making the header a distinctive red background colour. The title is also altered to show the application is in Test Mode. The “TEST MODE” name can be configured in Global Settings> TestSettings.AppTitle> TestMode> Setting Value. The value here will become the title that appears in the header when in “Test Mode”.

7.2.14.1 Notifications Whitelist in Test Mode

When in Test Mode, Alerts are only sent out to People on the specified White List. This allows real People to be in the system and to be linked to Alerts through Distribution Groups, but to not receive false or test Notifications sent from triggered Alerts.

The White List is a Global Setting and can be configured in Global Settings> TestSettings> Whitelist> Setting Value. Only People with their email or mobile phone number listed in csv format will receive Notifications. In the example shown in Figure 109, any Alert that was to be emailed to emailname1@domain.com would still receive alerts in test mode. Note that emailname2@domain.com has an “=” equal sign after it, so emails bound for that Person are forwarded to emailname3@domain.com.



The screenshot shows a configuration form for the 'Whitelist' setting. The 'Setting Group' is 'TestSettings' and the 'Setting Key' is 'Whitelist'. The 'Setting Can Be Overridden' checkbox is checked with an 'x' icon. The 'System' checkbox is checked with a checkmark icon. The 'Description' field contains the text: 'CSV list of email addresses and SMS numbers. These users will receive alerts in Test/Replay mode'. The 'Setting Value' field contains the text: 'emailname1@domain.com, emailname2@domain.com=emailname3@domain.com'.

Figure 109: Edit Whitelist in the Global Settings

Text messaging (SMS) can also be configured with a third party provider to redirect emails out of the system to mobile phone numbers.

NOTE: If a user’s email address or mobile phone number is added to the white list without specifying a replacement (by using the “=” sign), that email/mobile phone number is on the whitelist and Alerts will go to the real Person within the system (allowing real People in the system to receive test messages (SMS) within Test Mode).

7.3 Administrator Workflows

The workflows listed in this section must be done by a user who is Signed In as an Administrator. Most of the tasks involve creating and editing across multiple tabs tying together different tabs from the Admin Section.

7.3.1 Add Numbers to the Map Indicators

In order to display Statistics Values on the map, a Statistic Definition must be created. In this workflow we will create a Statistic Definition for the latest Stream Height value.

1. Navigate to the Admin section> Statistics and Legends> Statistic Definitions tab
2. Click “Add New Statistic Definition” button.

Create Statistic Definition ?

Name:

Display Name:

Type:

Unit Group:

Unit:

Parameters:

Active: Yes No

Figure 110: Creating New Statistic Definition

3. Beside Name, type "LATEST" (standard practice is to use ALL CAPS)
4. Beside Display Name, type "Latest" (or choose another term. This will appear in the Statistics menu of the Data Section. Standard practice is to use Title Case).
5. Choose the Type: "Latest" from the drop-down menu
6. Choose Unit Group from the drop-down menu: Length
7. Choose Unit from the drop-down menu: Metres or feet
8. Choose Parameter from the drop-down menu: Height of Gauge (River Stage)
9. Click the Active radio button beside "Yes".
10. Click "+ Add Parameter"

Parameter - Height of Gauge (River Stage)

Precision:

Legends - Latest:

Calculations: _____ Actions: _____

Figure 111: Adding a New Parameter to the Statistic Definition

11. Beside Precision, type "2" (this for two decimal places)
12. Click "+ Add Calculation"

The screenshot shows a form titled 'Calculations' with the following fields:

- Calculation:** A text input field containing the text `GetValue(EOR)`.
- Update Interval (minutes):** An empty text input field.
- Transformations:** An empty text input field with a small square icon to its right.
- Data Set Label Filter:** An empty text input field.

At the bottom right of the form, there are two buttons: a green 'Create' button and a grey 'Cancel' button.

Figure 112: Adding a New Calculation to the Statistic Definition

13. Beside Calculation, type “GetValue(EOR)” (EOR= End Of Record)
14. Click “Create”.

Navigate back to the Data>Map view to check the latest Stage Parameter Statistic Indicators with numbers on the Map.

7.3.2 Creating Info Requests

The Reports tab displays a list of Info Requests. These are text-based reports that can be displayed through the WebPortal, or requested via Email or Text Message (SMS), more information see section 6.

Info Requests are entirely custom, to display Info Requests one will first need to be created. Info Requests are defined through scripts using AQUARIUS SupaScript (see section 8.5), this allows for the information displayed by Info Requests to be as simple or complex as required.

The following workflow creates an Info Request that displays the predicted high-tide value for tomorrow and the following day (based on a pre-existing time-series using the yearly tide book).

7.3.2.1 Step One – Adding a Script

Scripts are used to create complex pieces of logic that can expand on the standard system functionality. In this instance we will be using a Script to read the Time-Series and perform a Time-Series Process which gets the maximum Daily values out.

Start by created a Script in the Scripts and Extensions tab of the Admin Section. Give it a name of “Tide Report” and a Script Type of “Info Request”. Copy the Script Function text from below and paste it into the Script Text Area.

```
Function TideRep(ByRef Error As String) As String
String sErr = ""
String sResult= ""
Int nIdx
Int nCount1
Int nCount2
String sData1[4] = ""
String sData2[4] = ""
DateAndTime tEvent
String tValue
```

```

TideRep = TideRep & "Tide Report (TIDERE) for " & FORMAT_DateAndTime(NOW_DATEANDTIME, "ddd,
dd MMM yyyy") & ":"

sResult=GetTimeSeriesData(sErr,
"AQUARIUS(TideLevel_AHD.PREDICTED@540495),Maximum(Daily,True)", "(0)-(0)-(1) 00:00:00","(0)-
(0)-(3) 00:00:00")
If (IsNull(sErr)) Then
  nIdx= 0
  nCount1 = STR_SPLIT(sResult,LF,sData1)
  If (nCount1>3) Then
    nCount1=3
  End If
  Do While (nIdx<nCount1)
    nIdx = nIdx + 1
    nCount2 = STR_SPLIT(sData1[nIdx],TAB,sData2)
    If (nCount2>3) Then
      tEvent=sData2[1]
      tValue=sData2[2]
      If (nIdx=2) Then
        TideRep = TideRep & CRLF & " The high tide for tomorrow is expected to be "
          TideRep = TideRep & FORMAT_FLOAT(tValue,"1.2L") & " m at " &
FORMAT_DateAndTime(tEvent, "HH:mm tt") & "."
      Else If (nIdx=3) Then
        TideRep = TideRep & CRLF & " The high tide for the following day is expected to
be "
          TideRep = TideRep & FORMAT_FLOAT(tValue,"1.2L") & " m at " &
FORMAT_DateAndTime(tEvent, "HH:mm tt") & "."
      End If
    End If
  Loop
Else
  TideRep = TideRep & CRLF & "An unspecified error occurred"
End If

End Function

```

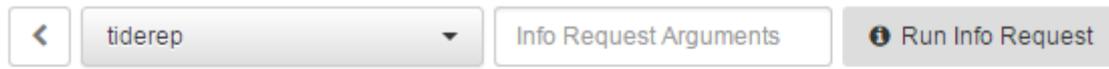
The Script function extracts the Time-Series after it has been processed with the maximum Time-Series Process (see section 8.4 for more information). This will extract the Maximum value for each day specified. The Relative Date specification (see section 8.2 for more information) requests the data from tomorrow for 2 days.

The bulk of the Script is a loop which ignores the first result, extracts the second result (tomorrows high-tide), then gets the last result (high-tide for the following day). These are output in friendly text.

Save the Script by pressing the Save and Publish button.

7.3.2.2 Step Two - Test the Info Request

To test the Info Request go to the Reports tab in the Data Section. If "tiderep" is the only Info Request this should auto-load without having to be selected.



Tide Report (TIDEREPA) for Tuesday, 05 May 2015:
 The high tide for tomorrow is expected to be 1.18 m at 23:14 PM.
 The high tide for the following day is expected to be 1.15 m at 23:53 PM.

Figure 113: TideRep Info Request

If the Info Request hasn't displayed make sure the Script is set to Active and make sure to Build and Publish successfully.

7.3.3 Create Legend based on Values

Legends based on Values are used when the Values are represented by a range shown in each coloured bands of a Legend.

Precipitation and Temperature legend examples are shown in Figure 114.



Figure 114: Precipitation and Temperature Legends

Creating a Legend involves writing calculations to define which band the Value falls into.

7.3.3.1 Step One – Adding a Legend

To create a Legend, navigate to the "Legends" tab under "Statistics and Legends" on the Admin screen. Pressing the "Add New Legend" button will bring up the create form. In this workflow we will be creating a legend against the Air Temperature Parameter.

Fill in the Display Name as "Air Temperature Legend" and set the Type to "Statistics – Calculation". Set the Unit and then select a Legend Style. In the section headed Legend Bands there will now be a number of Legend Bands with options to include Display Text and a Calculation.

Legend Bands

Legend Band	Display Text	Calculation
1	Not available	= NULL
2	<32 °F	= < 32
3	32 - 45 °F	= >= 32 && < 45
4	45 - 75 °F	= >= 45 && < 75
5	75 - 90 °F	= >= 75 && < 90
6	>90 °F	= >= 90

Figure 115: Calculation Legend

To build the logic for this Legend, you would usually start with NULL where a Value is not available or has not been calculated, then have a “less than” value first, then work down in order of relevance to the chosen Legend Bands and finish with a “greater than or equal to” value as shown in Figure 115.

The Is Default option should be selected (usually as the “Not Available” Legend Band) for values that fall outside the logic (in the event there is an error in the calculation logic).

NOTE: When using qualifiers in the equations, spaces are needed between each part of the calculation (e.g. after a qualifier “<”, “>”, “<=”, “>=”, operator “&&”, “||” or numeral).

A maximum of two parts of logic can be joined together in an equation (e.g. > 10 is one condition < 5 || > 8 is two conditions). This logic splits on spaces and expects either 2 or 5 values (qualifier, number OR qualifier, number, operator, qualifier, number). Refer to Table 9 for more information on allowable Symbols and Meanings.

Symbols	Meaning
<	Less than
<=	Less than or equal to
>	Greater than
>=	Greater than or equal to
&&	and
	or

Table 9: Equation qualifiers and symbols

In the Figure 115 example the Display Text uses HTML symbols. This allows the ° degree symbol and others to be displayed in the Legend. For more information on using symbols within Legends (or elsewhere within the WebPortal) see section 8.9.

The Legend once finished and applied to the Map will look like Figure 116. Step Two will show you how to add the Legend to the Map.

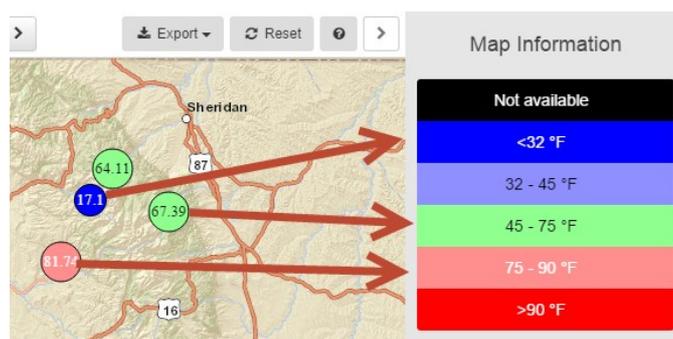


Figure 116: Calculation Legend Example

7.3.3.2 Step Two – Associating to a Statistic Definition

Our Legend has been created and for it to apply to the Map we need to associate it with a Statistic Definition. The Statistic Values from that Definition are what get feed into the Legend and evaluated by the Calculations.

In this example we already have a Statistic Definition that shows the “Current Temperature” for the Parameter so we’ll associate this Statistic Definition to our Legend.

Parameter - Air Temperature

Figure 117: Statistic Definition Associated to a Legend

Set “Air Temperature Legend” as one of the “Legends – Latest” available for the Air Temperature Parameter and Save the Statistic Definition.

NOTE: Periodic Statistics allow you to set a Legend for each Interval (e.g. Daily, Monthly). For the example above a single Legend of Temperature is appropriate, however some data may require a Legend to be scaled up for different Intervals.

For example, Total Rainfall over a Year will need a larger Legend than Total Rainfall over a Day. Figure 118 shows where three Legends of different scale have been applied to Rainfall.

Parameter - Rainfall



Figure 118: Rainfall with Scaled Legends

7.3.4 Create Legend for States based on Parameter Ranges (e.g.: Flood Levels)

State Definitions based on Parameter Ranges are typically used for cases such as:

- **Compliance**
Parameter Ranges may be setup for a particular Parameter based on regulatory compliance (e.g.: Drinking water standards). See Figure 119 for an example where the pH value falls outside the range and is non-compliant.

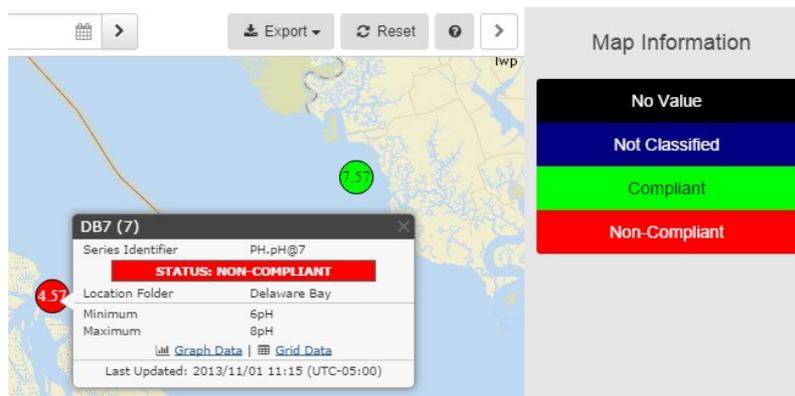


Figure 119: Non-Compliant Value corresponding to Legend

- **Permits/Licences**
Parameter Ranges may be setup for a particular Parameter (either globally and/or for particular monitoring points) based on permits or licences. Applications include checking observed data against permits for industrial/trade waste discharge and also for indicating operating zones for water abstractions.
- **Local Critical Levels**
A typical example would be setting Minor, Moderate and Major flood levels for specific river gauges and this is the example used in this workflow. See Figure 120 for an example where the value is above the local Moderate Flooding Level.

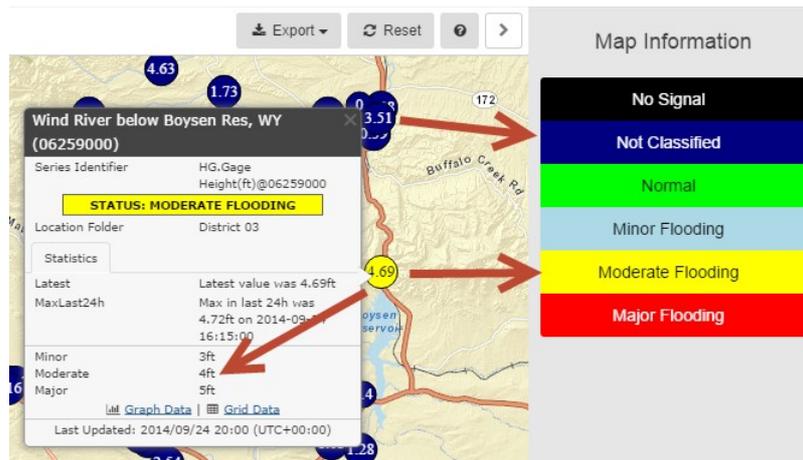


Figure 120: Indicator Popup Status corresponding to Legend

The Parameter Ranges may be global for the associated Parameter or can also be defined for Location Type or even specific Locations.

In the workflow example a Legend is created against the Gauge Height Parameter to show flooding. At each Location in the WebPortal you store levels to indicate different types of flooding (Minor, Moderate and Major) and when viewing the data the Legend is applied based on whether the data has breached one of those levels.

While this example is for Flooding, the concept can easily be applied to Reservoir Spill levels, Environmental Licencing (licence for businesses to pollute at certain levels), Water Usage Licencing, etc.

The process involves five steps, each briefly described below:

1. Create Value Storage (Parameter Range Definition)
2. Create Evaluation (State Definition)
3. Create Legend
4. Associate Legend to Statistic Definition
5. Add a Parameter Range Value

7.3.4.1 Step One – Adding a Parameter Range Definition

Parameter Range Definitions are a concept used to define Ranges stored against Parameters. Some examples might be Reservoir Spill Level, Flooding Levels, Maximum and Minimum Value Range. In our example we are creating Minor, Moderate and Major flooding levels against the Gauge Height Parameter.

NOTE: Parameter Range Definitions don't store values, they just define what values need to be stored. The values themselves will be added in Step Five.

To create a Parameter Range Definition, navigate to the “Parameter Range Definitions” tab under “Parameters and Units” on the Admin screen. Pressing the “Add New Parameter Range Definition” button will bring up the create form.

We will name the Parameter Range Definition “Flooding Levels”.

The Context is where the values will be stored. Since the levels that indicate a flooding event are Location specific, we will choose the “Location” context. This will allow us to define the Minor, Moderate and Major levels on a per-Location basis.

As we are defining ranges against the Gauge Height only, “Compatible Parameters – Common Unit” will be chosen for the Classification Type. If multiple Parameters are required, then “Non-Compatible Parameters” can be chosen, and any number of Parameters can be defined. In this case, we only need to define one, so “Metres” and “Height of Gauge” can be chosen for the “Unit” and “Parameter” options respectively.

Create Parameter Range Definition ?

Name

Contexts

Classification Type

Parameters

Unit

Parameters

Figure 121: Create Parameter Range screen

We can now define the Ranges that we need to store, in our case these are the Flood Levels. “Minor”, “Moderate” and “Major” are the Ranges (levels) we are storing in this example.

Ranges

	Display Name	Colour	Options
+ 1	<input type="text" value="Minor Flooding Level"/>	<input type="text"/>	<input type="button" value="🗑"/>
+ 2	<input type="text" value="Moderate Flooding Level"/>	<input type="text"/>	<input type="button" value="🗑"/>
+ 3	<input type="text" value="Major Flooding Level"/>	<input type="text"/>	<input type="button" value="🗑"/>

Legend Style

Chart Overlay

Figure 122: Defining three Parameter Ranges

From here we can also define a way for our Ranges to be overlaid on Charts. For this example we will skip this step. Set the Legend Style as “Flood” but set the Chart Overlay option as “Don’t Overlay on Charts”.

The Parameter Range Definition can now be created by pressing the “Create” button.

7.3.4.2 Step Two – Adding a State Definition

State Definitions are a concept that takes Parameter Range values and uses them to come up with a State (State Definitions have other uses not detailed here). In our example the States are around flooding so we will have a Normal State and a Minor State (where the Gauge Height has breached the Minor Flooding Level), etc.

Some other examples of states might be a Compliant and Non-Compliant State for Environmental Monitoring or a Compliant and Licence Exceeded State for Water Usage Licencing, etc.

To create a State Definition, navigate to the “State Definitions” tab under “Data Sets” on the Admin screen. Pressing the “Add New State Definition” button will bring up the create form.

For the Name we’ll use “MMMSTATE” (Minor/Moderate/Major) and set the type as “Parameter Range”. We’ll then set our Parameter Range as the “Flooding Levels” that we created in Step One above.

NOTE: State Definitions are used internally to process values for Legends and Alerts. Names are used as internal identifiers only, it is therefore recommended that short, capitalised names with no spaces are used.

Create State Definition ?

Name	MMMSTATE
Type	Parameter Range
Parameter Range	Flooding Levels

Figure 123: State Definition linked to Parameter Range Definition

In the section below a States window has appeared, this is where we create our evaluations. Click the “Add State” button three times.

In our example we store three levels with the largest being Major. For our States we need to check first whether the value is above Major. We would then check whether the value was above the Moderate level and so on.

Set the Qualifier to “>= (Greater than or Equal to)” for the three States added. Then set the values in reverse order as Major, Moderate and Minor Flooding Level last. For the State name itself, use a capitalised version of the short name (e.g. “MAJOR”).

States + Add State

Qualifier	Value	State	Options
Value being evaluated is null			
	=	NOVALUE	
No Parameter Range values exist for the Data Set, unable to evaluate state			
	=	NOTCLASSIFIED	
+ Value is	>= (Greater than or Equal to)	Major Flooding Level	= MAJOR
+ Value is	>= (Greater than or Equal to)	Moderate Flooding Level	= MODERATE
+ Value is	>= (Greater than or Equal to)	Minor Flooding Level	= MINOR
Value falls outside the Parameter Ranges as defined above			
	=	DEFAULT	

Figure 124: States of Flooding

In Figure 124 we can read across the page to get an understanding of how the evaluation works:

1. If we have no value to evaluate the State is “NOVALUE”; otherwise
2. If the Minor/Moderate/Major levels don’t exist the State is “NOTCLASSIFIED”; otherwise
3. If the Value is Greater Than or Equal to the Major Flooding Level, the State is “MAJOR”; otherwise
4. If the Value is Greater Than or Equal to the Moderate Flooding Level, the State is “MODERATE”; otherwise

5. If the Value is Greater Than or Equal to the Minor Flooding Level, the State is “MINOR”; otherwise
6. The State will default to “DEFAULT”

The State Definition can now be created by pressing the “Create” button.

7.3.4.3 Step Three – Adding a Legend

Now the Legend itself can be created. Most of the hard work is done in the State Definition where evaluation takes places, the Legend creation involves simply matching these States to names and colour bands to create the Legend.

To create a Legend, navigate to the “Legends” tab under “Statistics and Legends” on the Admin screen. Pressing the “Add New Legend” button will bring up the create form.

Set the name to “Flood Type” then set the type to “States – Parameter Range” and last chose the “MMMSTATE” we just created for the State Definition. You’ll notice that “Flood” has been pre-filled as the Legend Style, the Legend Style was set in the Parameter Range Definition in Step One and can be changed there.

The screenshot shows a form titled "Create Legend" with a help icon in the top right corner. The form contains four rows of input fields:

- Name:** A text input field containing "Flood Type".
- Type:** A dropdown menu showing "States - Parameter Range".
- State Definition:** A dropdown menu showing "MMMSTATE".
- Legend Style:** A dropdown menu showing "Flood".

Figure 125: Creating a Flood Type Legend

The next step is to create the Legend Bands by matching them to a State. In Step Two we described where each State would apply, so it’s simply a matter of creating a short user friendly Display Text to be shown in the Legend:

- NOVALUE as a State is when there is no Value to evaluate. On the Map this would be an indicator with no Statistic Value displayed inside it. We would consider this to be “No Signal” (“No Data” would be more appropriate for non-telemetry data)
- NOTCLASSIFIED is where no Minor/Moderate/Major levels are set for the location, we can’t Classify the data not matter what value it has so “Not Classified” is used as the Display Text
- Where the value falls outside all ranges (Minor/Moderate/Major) this is what would be considered “Normal” or instead “No Flooding”
- The other three levels match with their State “Minor Flooding” to “MINOR”, etc.

Legend Bands

Legend Band	Display Text	State	Options
1	No Signal	NOVALUE	Include Don't Include Is Default
2	Not Classified	NOTCLASSIFIED	Include Don't Include Is Default
3	Normal	DEFAULT	Include Don't Include Is Default
4	Minor Flooding	MINOR	Include Don't Include Is Default
5	Moderate Flooding	MODERATE	Include Don't Include Is Default
6	Major Flooding	MAJOR	Include Don't Include Is Default

Figure 126: State Definition based Legend

The “Include” option should be selected for each of our Legend Bands (this is whether to show the band as part of the Legend). The No Signal should be set as the Default (this is where a value doesn’t evaluate against any of the States for some reason, we want it to default to “No Signal”).

The Legend can now be created by pressing the “Create” button.

7.3.4.4 Step Four – Associate to a Statistic Definition

Our Legend has been created and for it to apply we need to associate it with a Statistic Definition. The Statistic Values from that Definition are what get feed into the Legend and evaluated by the State Definition.

In this example we already have a Statistic Definition that shows the “Latest Measurement” for the Gauge Height Parameter so we’ll associate this Statistic Definition to our Legend.

Parameter - Height of Gauge (River Stage)

Precision

Legends - Latest

[Remove Parameter](#)

Figure 127: Statistic Definition Associated to a Legend

Set “Flood Type” as one of the “Legends – Latest” available for the Gauge Height Parameter and Save the Statistic Definition.

7.3.4.5 Step Five – Adding a Parameter Range Value

The Last step is to now add some values that will be evaluated for our Legend. Chose a Location to edit. In this example I’ve picked a Location a Dam in an isolated location, this will make it easier to see our Legend.

At the bottom of the Location Data Entry Form a new section has appeared entitled “Parameter Ranges”. These are the three Ranges we defined back in Step One.

Set some appropriate values for potential Flooding at this Location. In this example the Dam is currently at 98.78 metres, so I’ll set values of 99, 100 and 101 (these values are examples and are in no way indicative of real flooding levels).

The screenshot shows a form with two input fields at the top: "Elevation" with a value of 0 and a unit dropdown set to "Metres", and "UTC Offset" with a value of 10. Below these is a section titled "Parameter Ranges" containing three rows of input fields. The first row is for "Minor Flooding Level" with a value of 99 and a unit of "m". The second row is for "Moderate Flooding Level" with a value of 100 and a unit of "m". The third row is for "Major Flooding Level" with a value of 101 and a unit of "m".

Height of Gauge (River Stage)	Parameter	Value	Unit
Height of Gauge (River Stage)	Minor Flooding Level	99	m
	Moderate Flooding Level	100	m
	Major Flooding Level	101	m

Figure 128: Parameter Range Values

Click to Save the Parameter Range Values for the Location.

7.3.4.6 Test on Map in the Data Section

Select the appropriate Parameter, Statistic Definition and Legend to show the Data. Notice a single green indicator with 98.78 as the Latest Measurement which corresponds to “Normal” on our Legend. The rest of the Locations are “Not Classified” because we haven’t set Range values yet.

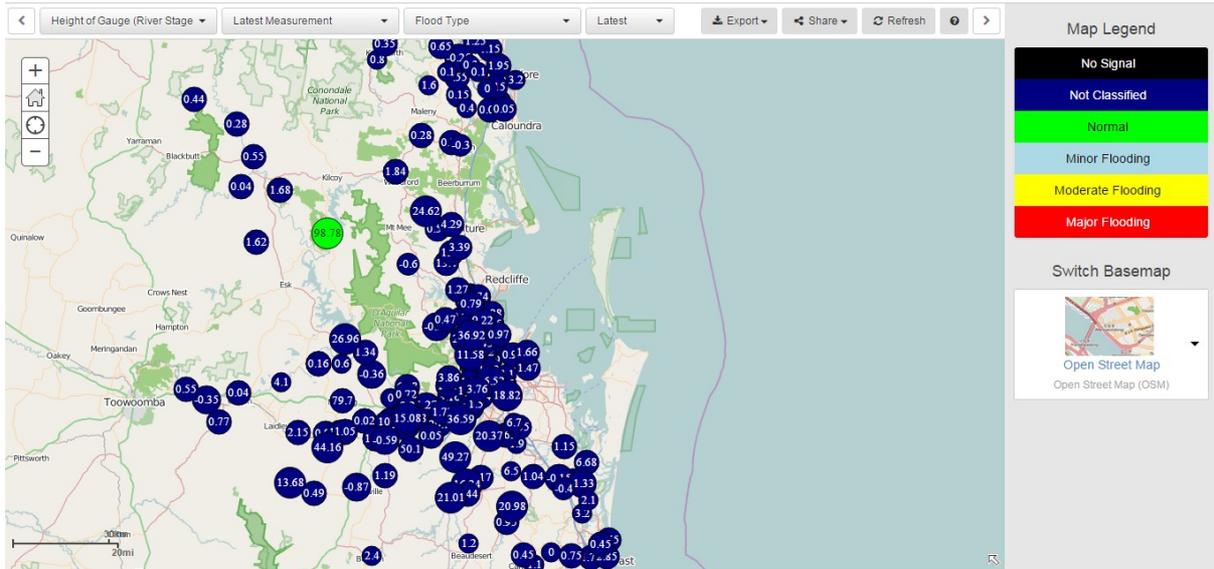


Figure 129: Single Indicator Classified by Legend

Hover the mouse over the indicator to show more information. We can see the Latest Measurement and that it is below our 99m Minor Flooding Level giving us a Status of “Normal”.

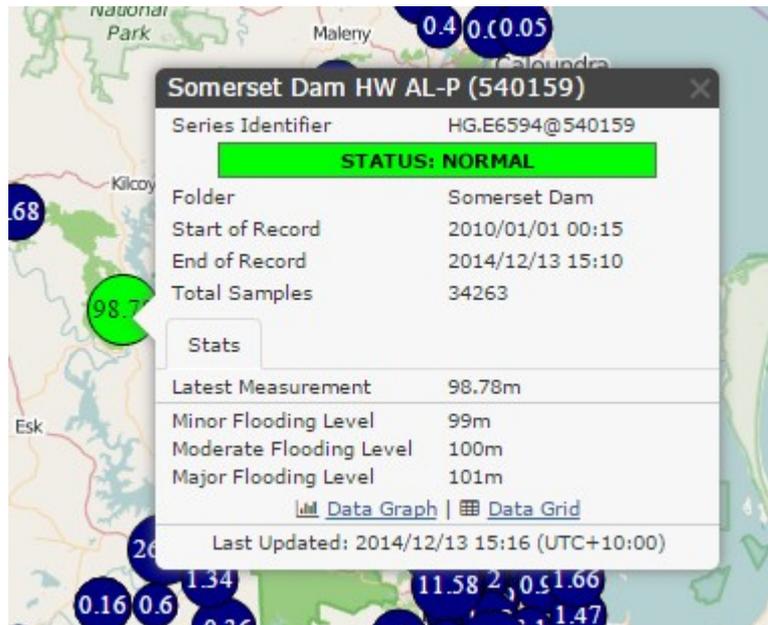
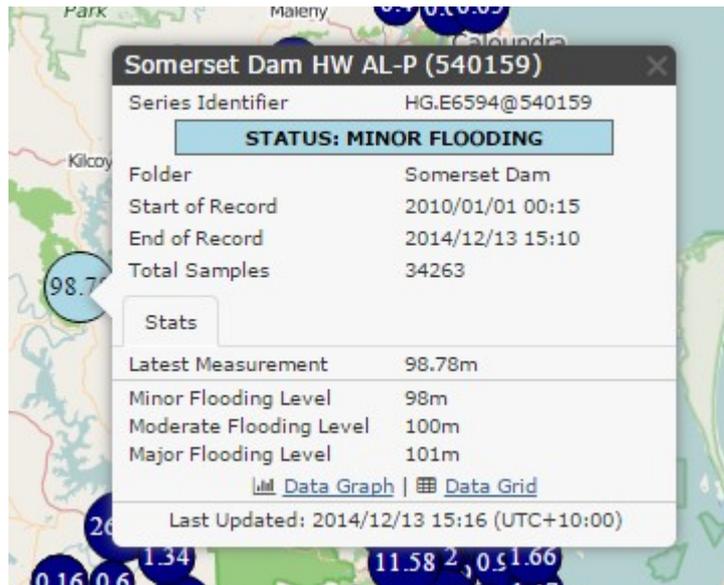


Figure 130: Indicator Popup showing Normal Status

Changing the Minor Flooding Level down to 98 metres means our value is now above the Minor Flooding Level. We can see this reflected in our indicator which is now light-blue and our popup which shows a Status of “Minor Flooding”.



Step Five can be repeated to add the Location-specific flooding levels to each of the locations in the system.

7.3.5 Create Legend for Calculated State Values

In addition to State Definitions that are based on Parameter Ranges as described in the previous workflow (see section 7.3.4), AQUARIUS WebPortal also provides the capability to define State Definitions based on a calculation using the AQUARIUS SupaScript language.

Scripts for calculating State values for time-series datasets are able to retrieve both time-series and associated meta-data for the associated data set. Meta-data includes information such as location and parameter information as well as the available period of record and the last updated time and this information may be used in cases such as determining data currency (e.g.: determining whether the data should be considered as current or overdue).

Reading of time-series data associated with a Data Set can be used for analysis of the trend for example “Rising”, “Rising Rapidly”, “Steady” or “Falling” (as opposed to Statistic Values which are always numeric).

This workflow details how to create a Data Currency legend through the use of Scripting. Although the example could easily be extended to anything else which uses the meta-data of a Data Set.

The process involves three steps, each briefly described below:

1. Writing a Script to Determine State (Script)
2. Automate State Determination (State Definition)
3. Create Legend associate to State Values (Legend)

7.3.5.1 Step One – Adding a Script

Scripts are used to create complex pieces of logic that can expand on the standard system functionality. In this instance we will be using a Script to read the Data Set's meta-data and determine if the results are out of date. This is achieved by comparing the meta-data's End Time to the Current Time and looking at the difference.

Start by created a Script in the Scripts and Extensions tab of the Admin Section. Give it a name of "Calculate Data Currency" and a Script Type of "State Calculation - Time-Series". Copy the Script Function text from below and paste it into the Script Text Area.

NOTE: This script uses the End Time of the Time-Series as well as the current time of the server machine. The script will only calculate correctly if the Time Zone of the Time-Series matches the Time Zone of the server machine.

```
Function DataCurrencyState(ByRef Error As String , ByRef StateInfo As Dictionary, ByVal SeriesID As String) As String
    Const Float OverdueRealTime = 0.25
    Const Float OverdueFieldVisit = 60.0
    Dictionary properties
    String result = null
    String seriesParam
    String seriesLabel
    DateAndTime eor = null
    Float currency = null

    Error=null
    properties = GetTimeSeriesProperties(Error, SeriesID)
    If (IsNull(properties)) Then
        result = null // Assume series does not exist
    Else If (IsNull(Error)) Then
        seriesParam=STR_EXTRACT(SeriesID, ".", True)
        seriesLabel=STR_EXTRACT(SeriesID, "@", True)

        If (IsNull(properties["DataSet.EndTime"])) Then
            eor = null
        Else
            eor = properties["DataSet.EndTime"]
            currency = DateTimeDifference(eor,NOW_DATEANDTIME,"d")
        End If

        If (IsNull(eor)) Then
            result = "NODATA"
        Else If (seriesLabel="Field Visits") Then
            If (currency>OverdueFieldVisit) Then
                result = "OVERDUE"
            Else
                result = "CURRENT"
            End If
        Else If (seriesLabel="Telemetry") Then
            If (currency>OverdueRealTime) Then
                result = "OVERDUE"
            Else
                result = "CURRENT"
            End If
        Else
            result = "UNCLASSIFIED"
        End If
    End If
End If
```

```
DataCurrencyState = result
End Function
```

The Script Function extracts the meta-data, finds the difference between the End Time and Current Time and then analyses this against the Data Set. For Field Visits the tolerance is 60 days while for Telemetry the tolerance is 0.25 days (6 hours). All other data is unclassified.

The example Figure 131 explains each of the sections of the Script Function.

```

1 Function DataCurrencyState(ByRef Error As String, ByVal SeriesID As String) As String
2   Const Float OverdueRealTime = 0.25
3   Const Float OverdueFieldVisit = 60.0
4   Dictionary properties
5   String result = null
6   String seriesParam
7   String seriesLabel
8   DateAndTime eor = null
9   Float currency = null
10
11   Error=null
12   properties = GetTimeSeriesProperties(SeriesID, Error)
13   If (IsNull(properties)) Then
14     result = null // Assume series does not exist
15   Else If (IsNull(Error)) Then
16     seriesParam=STR_EXTRACT(SeriesID, ".", True)
17     seriesLabel=STR_EXTRACT(SeriesID, "@", True)
18
19     If (IsNull(properties["DataSet.EndTime"])) Then
20       eor = null
21     Else
22       eor = properties["DataSet.EndTime"]
23       currency = DateTimeDifference(eor, NOW_DATEANDTIME, "d")
24     End If
25
26     If (IsNull(eor)) Then
27       result = "NoData"
28     Else If (seriesLabel="Field Visits") Then
29       If (currency>OverdueFieldVisit) Then
30         result = "Overdue"
31       Else
32         result = "Current"
33       End If
34     Else If (seriesLabel="Telemetry") Then
35       If (currency>OverdueRealTime) Then
36         result = "Overdue"
37       Else
38         result = "Current"
39       End If
40     Else
41       result = "Unclassified"
42     End If
43   End If
44
45   DataCurrencyState = result
46 End Function

```

Figure 131: Data Currency Script Example

The other thing to notice are the words used for the State. “NoData”, “Overdue”, “Current” and “Unclassified”. These are the values that will be set for the State.

Set this script as Active and press Build to make sure it contains no errors. Then click “Save and Publish” so the Script is published and accessible to be run in the WebPortal.

7.3.5.2 Step Two – Adding a State Definition

State Definitions are a concept used to automate the process of running the Script that generates our State Value (State Definitions have other uses not detailed here). In our example the Script will be run against all Data Sets to determine their currency.

Create a new State Definition from the Data Sets > State Definitions tab in the Admin section. Name the State Definition “DATACURRENCY”, set the Type as “Script Function –

Time-Series” and set nothing against the Parameters (this means it will run against all Data Sets of any Parameter).

Set the Update Interval to five minutes, this will set the State Calculation to run on a five-minute cycle. Set the Script Function to the function we created in Step One above “DataCurrencyState”. No arguments are required for this Script so set Active to Yes and Save the State Definition.

Figure 132 shows the 'Edit State Definition' form. The Identifier is set to 'DATACURRENCY'. The Type is 'Script Function - Time-Series'. The Parameters are 'Nothing selected'. The Update Interval (minutes) is '5'. The Script Function is 'DataCurrencyState' and the Arguments are empty. The Script Function field shows 'DataCurrencyState()'. The Active status is set to 'Yes'.

Figure 132: Script-Based State Definition

After this is saved AQIS will begin a background process to run the Script Function specified against each of the Data Sets in the System. The Data Set Identifier is passed into the Script specified, this calculates a State as text and the State is saved against the Data Set. The background process is run in a cycle which starts ever five minutes, keeping these State Values up-to-date.

7.3.5.3 Step Three – Adding a Legend

The Legend can now be created, which is a simple matter of matching Display Text to our State Values.

Create the new Legend with a name of “Data Currency” a Type of “States – Script Function – Time-Series” and a State Definition of “DATACURRENCY”, which we just created above. Set an appropriate Legend Style.

In the Legend Bands set the States to the values which are produced by the script: “OVERDUE”, “CURRENT”. Note that there is a special “ERROR” State which will be set if there is an issue running the Script.

Legend Bands

Legend Band	Display Text	State	Options
1	Error	= ERROR	Include Don't Include Is Default
2	Unknown	= UNCLASSIFIED	Include Don't Include Is Default
3	Normal	= CURRENT	Include Don't Include Is Default
4	Overdue	= OVERDUE	Include Don't Include Is Default

Figure 133: Legend Band – Script States

Click to Save the Legend of Script States.

7.3.5.4 Test in Map in the Data Section

To test the State-based Legend go to the Map in the Data Section. Under the Legend Selector a “Data Currency” Legend will appear under “State”. Select this Legend and watch the data load.

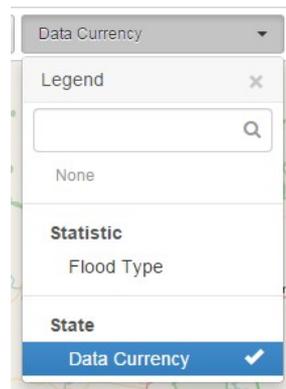


Figure 134: Legend Selector

When the Legend has been selected the Map Indicators will be classified into Normal and Overdue with green and red.

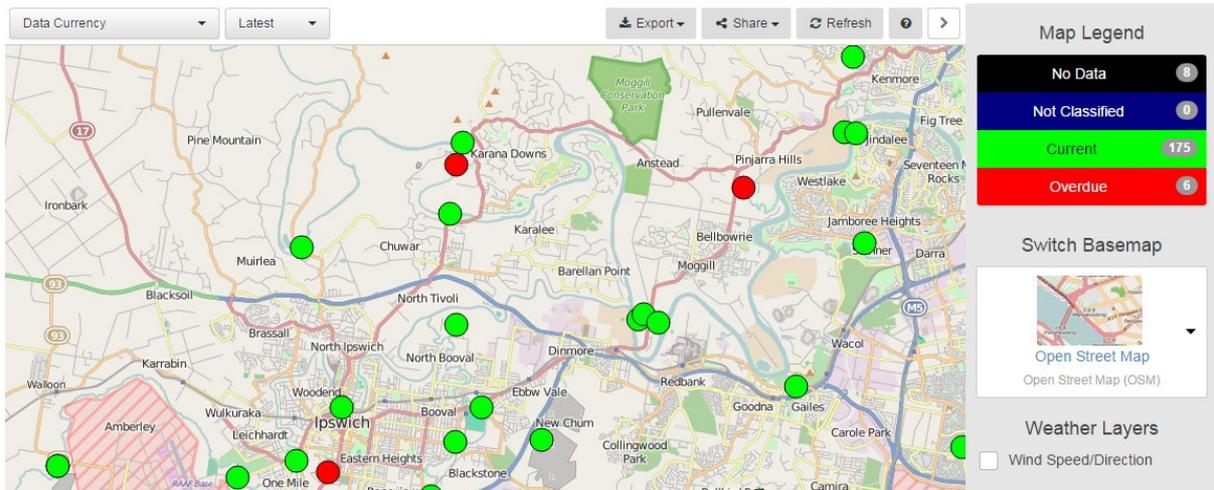


Figure 135: Data Currency

If the Data being displayed on the Map has associated Statistics the Data Currency Legend can still be displayed. When a Data Currency Legend is displayed on a Map showing Statistic Values, the Statistic Values are unrelated to the Legend.

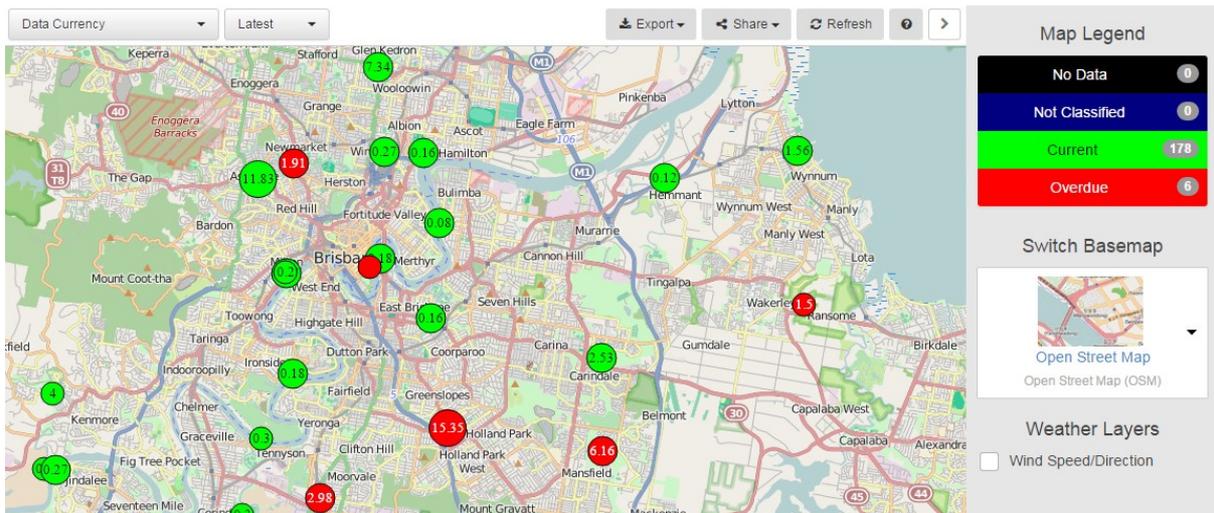


Figure 136: Data Currency with Statistics

7.3.6 Create a Widget Template – Embedded YouTube Video Example

While the System Templates in AQUARIUS WebPortal provide a wide range of uses, many users will require a custom Template. In this example, we will be creating a Widget Template that will load a YouTube video onto the Dashboard.

YouTube videos can be embedded in an IFrame element, and each video has a unique Video Id. We will create a Template that has an IFrame and a Placeholder for the unique Id.

From the Widget Template Tab, press the “Add New Widget Template” button. Give the Widget Template a name, and enter the following HTML into the Content text field.

```
<iframe width="##WIDGETWIDTH##px" height="##WIDGETHEIGHT##px"
src="https://www.youtube.com/embed/##VideoID##" frameborder="0"
allowfullscreen></iframe>
```

This is the IFrame which will load our YouTube Video. Note that there are three placeholders in the Content - ="##WIDGETWIDTH##", "##WIDGETHEIGHT##" and ##VideoID##. The WIDGETWIDTH and WIDGETHEIGHT Placeholders are System Placeholders, and will be replaced with the width and height of the Widget when it is rendered, ensuring that the video will fill up the Widget.

The third Placeholder is one that we must define ourselves. This is the Placeholder for the Youtube unique Id. To create a Text Input Variable, press the “Add Data Input” button found in the Input Variables section of the form. Set the Variable Identifier to “Videoid” (to match the Placeholder in our HTML above), and set the drop-down list value to Text. This will allow text to be used as an input when the Widget is created.

Create Widget Template

Name

Static Yes No

Content In Widget Yes No

Content

```
1 <iframe width="(##WIDGETWIDTH## -100)px" height="##WIDGETHEIGHT##px" src="https://www.youtube.com/embed/##VideoID##"
2   frameborder="0" allowfullscreen></iframe>
```

Javascript

```
1
```

Reload Method Yes No

Input Variables

Variable Identifier

Figure 137: Completed Widget Template Form

At the bottom of the form is a section for the Widget Template Instructions. This is an optional field that gives instructions on how to use the Widget Template on the Widget Form. Text or HTML can be entered here.

Widget Template Instructions

Instructions

```
1 <p>Insert the Video Id into the VideoId below. The YouTube Video Id can be found at the end of any YouTube
2   Video URL. In the example shown below, the Id is set to bold.</p>
3 <p style="text-align:center">https://www.youtube.com/watch?v=<b>dQw4w9WgXcQ</b></p>
```

Figure 138: Widget Template Instructions Field

Press "Create" to create the Widget Template. The new Widget Template can now be used to create a Widget. When the new Widget Template is selected in the Widget From, the Instructions and any Widget Variables defined will be displayed.

Create Widget

Widgets are panels displayed on a dashboard. Choose a name and Widget Template for the Widget

Name	<input type="text"/>
Widget Template	Embedded YouTube Video ▼

Instructions

Insert the Video Id into the Videoid below. The YouTube Video Id can be found at the end of any YouTube Video URL. In the example shown below, the Id is set to bold.

<https://www.youtube.com/watch?v=dQw4w9WgXcQ>

Input Variables

Use the Input Variables to set where the data will come from for your Widget.

VideoID	Fixed ▼	Value	<input type="text"/>
---------	----------------------	-------	----------------------

Figure 139: Widget with new instructions and Variables.

7.3.7 Create a Widget – Charts Example

While a Widget Template defines the layout and data required for a Widget, the Widget determines the display settings and the context of the data used. We will create two Widgets for displaying Charts; one with a Fixed chart and another where the chart will be chosen from the Widget Header. At least one Chart must exist for this example workflow.

From the Widget Tab, press the “Add New Widget” button. Give the Widget a name, and select the existing System Template “Chart (Saved Chart)”.

Create Widget

Widgets are panels displayed on a dashboard. Choose a name and Widget Template for the Widget

Name	<input type="text" value="Fixed Chart"/>
Widget Template	<input type="text" value="Chart (Saved Chart)"/>

Input Variables

Use the Input Variables to set where the data will come from for your Widget.

ChartId	<input type="text" value="Nothing selected"/>
---------	---

Figure 140: New Widget with Chart Template

The Input Variables for the Widget Template will appear. The drop-down list allows us to choose where we want the chart data to come from – we will select “Fixed”. Since the Template defines the ChartId Variable as a type of Chart, a Chart drop-down will appear. This is the Fixed value we will choose for our Chart.

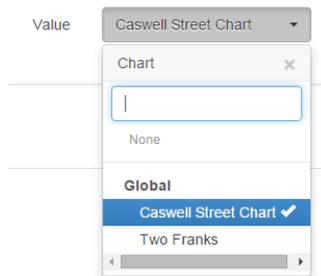


Figure 141: Chart Value Drop Down

In the Advanced Settings, we will set “Show Header” and “Show Footer” to No. Since the input is Fixed, there is no need for a header.

We wish to create a second Widget that takes a Widget input instead of a Fixed one. To simplify the process, we will Save & Clone the Widget from the menu next to the create button.

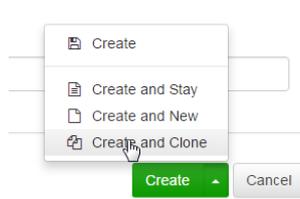


Figure 142: Create & Clone Widget

This will save our current Widget and return a cloned version. We will now change the name of our cloned version to “Select Chart”, and change our ChartId type from “Fixed” to “Widget”. Widget inputs are defined from the header of the Widget when rendered on the Dashboard. Widget inputs also have a Default Value, which we can set in the same way as we set our Fixed Chart.

Since the input is in the Widget Header, in the Advanced Setting Section we will set the “Show Header” option to “Yes”. The Widget can now be saved.

If both Widgets are placed on a Dashboard, the Fixed Chart Widget will load the Fixed Chart we set. The Select Chart Widget will allow the user to select from a list of Charts from the Widget Header. In Figure 143 the Fixed chart is on the left, and the Select Chart on the right.

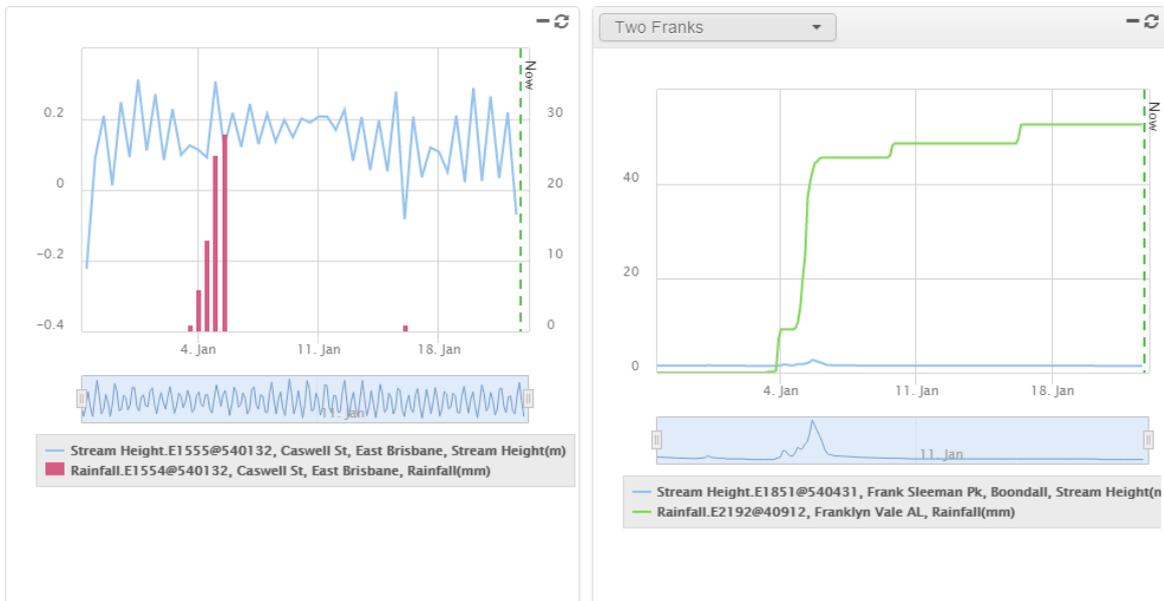


Figure 143: Fixed Chart and Select Chart

8 User Technical Reference

This section provides detailed reference material about some of the core concepts that underpin AQUARIUS WebPortal such as:

- Time-Series Transformations
- Relative Date/Time specifications
- Statistic Calculation Definitions
- Alert Trigger Functions
- WebPortal Scripting (AQUARIUS SupaScript)

It also include references material for other general concepts that can be used throughout the WebPortal by Admin users.

8.1 WebPortal Enhancement Options

AQUARIUS WebPortal Enhancements are added based on Licensable feature-sets. An AQUARIUS WebPortal licence will include a number of Locations and Users and optional enhancements around Alerts, Scripting and Statistics.

1. **Number of Locations:** The number of Locations in the monitoring network from AQUARIUS Time-Series
 - a. Locations coming into AQUARIUS WebPortal can be optionally filtered.
 - b. WebPortal Security can be used to assign a group of Locations to certain users (allowing a single WebPortal to serve multiple external customers).
2. **Number of Users:** The number of Users able to Sign In to the WebPortal, including whether public (anonymous) access is allowed.
 - a. Public access can be added by scaling up the number of Users in your Licence.
 - b. To enable public access a minimum of 100 users is required. 90 users will be reserved for public access to the WebPortal (Note: this does not limit the number of public users who can access the WebPortal at any one time).
3. **Enhanced Alerts:** The number of Alerts that can be defined in the standard AQUARIUS WebPortal is five. The Enhanced Alerting option allows for unlimited Alerts.
 - a. Alerts can be triggered based on values within the system reaching certain thresholds or going into certain states. Triggered Alerts can then automatically send Notifications.
 - b. Notifications can be sent via email or text message (SMS) allowing for instant notification of events while away from a computer.
4. **Enhanced Scripting:** The number of Scripts that can be defined in the standard AQUARIUS WebPortal is one Script per Script Type. The Enhanced Scripting option allows for unlimited Scripts. It also allows Information Requests to be performed using arguments.

- c. Scripting allows for significant enhancement of functionality to be created exactly to your requirements. It can be used to calculate States for Time-Series and Locations as well as create Information Requests.
 - d. Information Request Scripts can be used with arguments, this allows users to request more detailed information. For example, instead of requesting “sitrep” for a Situation Report on the entire monitoring network, you could request “sitrep nw” for a Situation Report on the North-West region only.
5. **Enhanced Statistics:** The number of Statistic Definitions that can be defined in the standard AQUARIUS WebPortal is two per Parameter, per Interval. The Enhanced Statistics option allows for unlimited Statistic Definitions.
- e. Statistics add value to your Time-Series data by performing calculations over the data.
 - f. Statistics can be as simple (e.g. yesterday’s maximum) or complex (e.g. lowest 6 hours of flow over last 7 days) as required.
 - g. Statistics can be viewed across the entire monitoring network (on the Map/Map Grid) for easy comparison across Locations, or displayed together on a per-Data Set basis.
 - h. Statistics calculated in the WebPortal reduce the need to export data into spreadsheets to calculate derived data.

To check on the usage of your current Licence and to see which enhancements are available, see section 5.2 on the Licence Status Page for more information.

If you would like to add enhancements to AQUARIUS WebPortal please contact your AQUARIUS Sales Representative. Once organised, a new licence will need to be applied to your WebPortal which can be done by your System Administrator.

8.2 Relative and Literal Date/Time Specifications

AQUARIUS WebPortal allows for dates and times to be specified either as literal or relative. Literal dates and times are an exact specification and should be entered in the following (ISO) format: yyyy-MM-dd {{H}H:mm{:ss}}. For example:

```
2010-07-23
2010-07-23 9:23
2010-07-23 15:47:32
```

Relative dates and times are specified in terms of an offset from a time reference. The default time reference is the current time of the AQUARIUS WebPortal server.

Relative dates and times may include offset specifications for any component of a date and time (i.e. Year, Month, Day, Hour, Minute or Second) and where a component is specified as an offset, it must be included in brackets ().

The table below shows relative date and time specifications and their resultant evaluation when the current time of the AQUARIUS WebPortal server is 2014-10-06 17:23:57.

Relative Date Time String	Result	Description
2010-(0)-(0) (0):(0):(0)	2010-10-06 17:23:57	This time in 2010. Year is specified as 2010 and all other date/time components are relative with an offset of 0 from the current time.
(0)-01-01 00:00:00	2014-01-01 00:00:00	The start of this year. Year is zero offset from that of current date/time, and rest of date is specified as 00:00:00 on January 1.
(-1)-(0)-(0) 12:00:00	2013-10-06 12:00:00	This day last year at 12pm
(0)-(0)-(0) (-1):(0):(0)	2014-10-06 16:23:57	One hour ago.

Table 10: Relative date/time specification

As well as referencing the current time of the AQUARIUS WebPortal server, relative times used to specify time ranges for time-series processes may be defined as offsets from either beginning of record (BOR) or end of record (EOR). Examples of this are shown below in Table 11.

Relative Date Time String	Description
EOR((0)-(-1)-01 00:00:00)	Start of month of end of record for Data Set being processed.
EOR((0)- (0)- (0) (-24): (0): (0))	24 hours prior to end of record for Data Set being processed.
EOR((1)-01-01 00:00:00)	First of January of year at 00:00:00 following start of record for Data Set being processed.

Table 11: Relative date/time specifications referenced to data period of record

8.2.1 Shortcuts

There are some shortcuts available to simplify the entry of some common relative date/time specifications. For example:

Shortcut	Full String	Description
<i>EOR(-2h)</i>	EOR((0)-(0)-(0) (-2):(0):(0))	2 hours prior to end of record
<i>+3D</i>	(0)-(0)-(3) (0):(0):(0)	3 days from now
<i>EOR(-1Y)</i>	EOR((-1)-(0)-(0) (0):(0):(0))	1 year prior to end of record

Table 12: Relative date/time shortcut notation examples

These shortcuts all have the following syntax:

<n><T>

where <n> is a whole number (either positive or negative)

<T> is a single character specifying the date/time component to which the offset is being applied and may be any of the following:

- Y (= Year)
- M (= Month)
- D (= Day)
- h (= hour)
- m = (minute); or;
- s (= second)

8.2.2 Use with Calculations

Relative times are used primarily for Statistic Definition Calculations. Times are set relative to the Beginning of Record (BOR), the End of Record (EOR) or Now (NOW). Where BOR and EOR are specified, they apply to the particular time-series being processed.

Some examples are shown below.

Example	Description
Intensity(EOR(-24h),EOR,01:00,Max)	The maximum intensity in a one-hour period over the last 24 hours of available data.
Intensity(EOR((0)-(0)-(0)00:00:00),EOR,01:00,Max)	The maximum intensity in a one-hour period occurring on the last day of record (i.e.: from midnight on the day of last available measurement until the time of the last available measurement).
Aggregate(BOR,EOR)	An aggregate value for full period of record (beginning of record to end of record)
Intensity(Minimum(EOR((0)-(0)-100:00:00),EOR))	The minimum intensity for the last calendar month of record (start of EOR month to EOR)

Table 13: Examples of Relative date/time notation with Statistic Calculations

8.3 Statistic Calculation Definitions

Statistic	Definition	Use
Aggregate	<p>Computes a representative period value within an interval.</p> <p>For total data (such as rainfall) the aggregate result will be a total.</p> <p>For instantaneous readings such as water level, the aggregate result will be a <u>time-weighted average</u> (i.e. not a simple arithmetic average of measurements).</p>	Latest and Periodic.
ARI	<p>Computes Annual Recurrence Interval for a given rainfall statistic. The ARI calculation is a derived statistic that is based on results from another statistic.</p> <p>For example, if you have a latest statistic named 'HEAVIEST1hx24', you can compute the associated ARI using the following calculation: ARI(HEAVIEST1hx24).</p>	Latest and Periodic
Count	Counts the number of time-series records within an interval. Typically the Count statistic will be used in conjunction with a data filtering process (such as an Event process)	Latest and Periodic
GetValue	<p>Retrieves/interpolates a value from a time-series for the specified time. Either actual or relative times may be used.</p> <p>"GetValue(EOR)" will get the value at "end of record" (i.e. the latest value) from a time-series.</p>	Latest only.
Intensity	<p>Calculates the max (or min) aggregate value over a sliding window of a specified duration. For example, "the maximum 5 minute rainfall total".</p> <p>For Latest statistics, a single max/min intensity will be computed over a specified period.</p> <p>"Intensity(EOR(-24h),EOR,01:00,Max)" will compute the maximum 1 hour intensity over the 24 hours to end of record.</p> <p>For Periodic statistics, both daily and monthly Intensities will be computed for each day/month of record.</p> <p>When computing a max (or min) intensity for any reporting period, the result will be the max/min for any window of the specified duration that <u>starts</u> inside the reporting interval. Therefore, it is possible to have a 24 hour maximum intensity for a day occurring on the 24 hour interval from 23:55pm so that only 5 minutes of the computed intensity actually fell on the reporting day.</p>	Latest and Periodic.
Maximum	This is the maximum value computed for the specified period. Whilst the maximum will typically be a measured point, it may also be an interpolated point (e.g. on slowly receding water levels the daily maximum value may be	Latest and Periodic.

	interpolated at midnight and all subsequent measurements may be less than this initial interpolated value).	
Minimum	This is the minimum value computed for the specified period. As is the case for Maximum, Minimum values may also be either actual measurements or interpolated interval boundary values.	Latest and Periodic.

Table 14: Time-series Statistics

8.4 Time-Series Processes

Time-Series Processes are inline processes that can be defined to perform pre-processing of Time-Series data before it is used in computing a statistic or displayed on a chart. Some processes are very closely linked to Periodic Statistics and so the same names and syntax may occur in both Statistic Definitions and processes.

Process	Definition	Examples
Aggregate	Computes a representative aggregate value at the specified time-step interval. The results may be an average, total, maximum or minimum depending on the input interpolation type.	Aggregate(01:00)
Count	Reports the number of measurements occurring with each time step. Measurements occurring on an interval boundary are counted only for the interval ending on the boundary (and not the subsequent interval)	Count(Monthly)
Decumulate	Decumulate takes interpolation type 1 data and turns it into type 5 data or takes type 8 data and turns it into type 6 data. The first parameter indicates whether decumulated negative values are valid, if not they are treated as zero. The second parameter is how large a negative number is needed to be counted as a reset of the accumulation. (This process is typically used for Precipitation data)	Decumulate(False, 2.0)
Event	<p>Extracts a single sample point associated with each event in which values were either above or below a specified threshold. <u>Syntax</u>: Event(<Threshold>[,<Duration>[,<Separation>[,<Type>]]])</p> <p>Where:</p> <ul style="list-style-type: none"> •<Threshold> is the threshold that values must cross in order to define an event. •<Duration> is the minimum time interval that a time-series must be beyond the threshold in order to define an event. This field is <u>optional</u> (defaults to 00:00). •<Separation> is the minimum separation time interval between events (subsequent crossings of the threshold within this time will be considered as part of the previous event). This field is <u>optional</u> (defaults to 00:00). •<Type> Must be either Max (to extract events above threshold) or Min (to extract events below threshold). This field is <u>optional</u> (defaults to Max) 	Event(3.5,01:00:00,00:30:00,Max)
FactorOffset	Applies a specified factor (multiplier) and offset to each value in a time-series.	FactorOffset(3.5,10)
Intensity	Computes the max/min intensity for a specified duration starting within each time-step interval.	Intensity(Monthly,01:00,Max)
Maximum	Computes the maximum value within each time-step interval.	Maximum(Monthly)
Minimum	Computes the minimum value within each time-step interval.	Minimum(06:00)

8.5 System Widget Templates

System Widget Templates are the Widget Templates that will be found in all installations of AQUARIUS WebPortal. The System Widget Templates are designed to access so fairly basic data from AQUARIUS WebPortal (such as Chart data) as well as some more common external data (such as Webcams, YouTube Videos and Twitter Timelines).

8.5.1 Free Text or HTML

The Free Text or HTML Widget Template allows any static text, images or links to be displayed on the page by typing it into the Content box. It can be used for the display of Welcome messages and static Notifications.

The template allows for HTML meaning HTML Codes (section 8.9) and Font-Awesome Icons (section 8.10) can be used.

```
<div style="margin: 0px; margin-top: -25px;">
  <h1> Welcome to AQUARIUS <span
  style="color: #31a926;">WebPortal</span></h1>
</div>
```

8.5.2 Chart (Data Set)

The Chart (Data Set) Widget Template allows for a Chart of a single Data Set to be shown on a Dashboard. For the DataSetId Input Variable choose a Data Set by searching for a Location then selecting a Data Set from that Location.

Data Set Charts will be displayed with all the pre-loaded Chart settings from Global Settings. To have more control over the display of the Chart use a pre-made Chart with the Chart (Saved Chart) Widget Template.

8.5.3 Chart (Saved Chart)

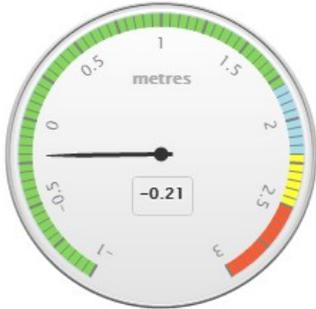
The Chart (Saved Chart) Widget Template allows for a pre-made Chart to be shown on a Dashboard. Being a Saved Chart this may include multiple Data Sets and Axes as well as being formatted to your choosing. For the ChartId Input Variable select a saved Chart from the list, if none exist they can be created from the Charts tab in the Data section of AQUARIUS WebPortal.

For a more simplistic Chart of a single Data Set the Chart (Data Set) Widget Template can be used.

8.5.4 Gauge

The Gauge Widget Templates allows for a Gauge to be displayed that shows a Latest Statistic Value for a Data Set. Using the first Legend associated with the Statistic, the Gauge is able to show where the Statistic Value falls on the colour bands of the Legend.

- For the GaugeDesign Input Variable select a Design for how the Gauge will be rendered onscreen (examples below).
- For the DataSetId Input Variable set choose a Data Set by searching for a Location then selecting a Data Set from that Location.
- For the StatisticIdentifier type the name of a Statistic Definition Identifier. The value displayed and the Legend used will be derived from this Statistic Definition.

Gauge Design	Example
RadialDial	 A circular gauge with a needle pointing to -0.21. The scale ranges from -1 to 3, with color bands: green (0 to 1), blue (1 to 2), yellow (2 to 2.5), and red (2.5 to 3). The needle is positioned at -0.21, which is in the green band. The word "metres" is written in the center.
HalfRadial	 A semi-circular gauge with a needle pointing to -0.21. The scale ranges from -1 to 3, with color bands: blue (-1 to 0), green (0 to 1), yellow (1 to 2), and red (2 to 3). The needle is positioned at -0.21, which is in the blue band. The word "metres" is written in the center.

NOTE: To show classified data the Gauge must be pointing to a Statistic with a valid Legend. The range of values shown on the Gauge is derived from the Legend with 10% padding. Without a Legend the Gauge doesn't have a range and will simply show a single unclassified point of data.

8.5.5 Grid (Script-Based)

The Grid (Script-Based) Widget Template allows for an interactive Grid to be displayed showing tabular data. The tabular data for this Template is sourced from AQUARIUS WebPortal Scripts that have been created with a Script Type of Data Table. For the GridId select a Data Table Script which includes the data to be displayed in the Grid.

Grids automatically show a column for each column returned in the Data Table Script.

8.5.6 Info Request

The Info Request Widget Template allows for dynamic text to be written to page in the form of an Info Request. Info Requests are created through AQUARIUS WebPortal Scripts by using a Script Type of Info Request.

For the InfoRequest Input Variable select an Info Request from the list. The Arguments Input Variable may be used by some Info Requests, set the Arguments required by the specific Info Request selected. If no Arguments are required this field must be set to a single space.

8.5.7 Status Page (Service)

The Status Page (Service) Widget Template allows the Service Status page (used for AQUARIUS WebPortal diagnostics) to be displayed on a Dashboard. This Widget Template requires no Content or Input Variables to be configured.

8.5.8 Status Page (Licence)

The Status Page (Licence) Widget Template allows the Licence Status page (used to check AQUARIUS WebPortal Licence usage) to be displayed on a Dashboard. This Widget Template requires no Content or Input Variables to be configured.

8.5.9 Embedded Website

The Embedded Website Widget Template allows an external Website to be embedded directly onto a Dashboard. For the URL Input Variable type the full URL (including http://) of the Website you want to embed on the Dashboard.

NOTE: Embedded Websites use Iframes which are subject to the [Same-Origin Policy](#). Websites can choose whether they wish to be displayed in an Iframe, for example <http://google.com> doesn't allow itself to be shown in an Iframe whereas <http://aquaticinformatics.com> does. Where a Website enforces the Same-Origin Policy the Widget is unable to show an error message, it will instead display an empty Widget.

8.5.10 Webcam (Image)

The Webcam (Image) Widget Template allows a Webcam feed to be displayed where the Webcam source is a [Motion JPEG image](#). For the URL Input Variable type the full URL (including http://) of the Webcam you want to embed, this URL should most likely end with the file-format .mjpg.

An example Webcam can be found in Salamanca, Hobart, Tasmania. The URL Input Variable of <http://120.29.240.91/mjpg/video.mjpg> can be used. (Webcam hosted by [TasmaNet](#))

8.5.11 YouTube Video

The YouTube Video Widget Template allows you to embed a YouTube video onto a Dashboard. For the VideoID set this to the unique code that identifies the YouTube Video.

There are several ways to find this code, from the URL https://www.youtube.com/watch?v=8cwiniJh_dQ the code is highlighted. Under the video YouTube also includes a Share option which uses a shorter URL https://youtu.be/8cwiniJh_dQ the VideoID can be found at the end of this Share URL.

As an example use “8cwiniJh_dQ” as the VideoID Input Variable. This will display the “Water Data Management – Faster Analysis. Better Decisions.” video from the Aquatic Informatics Inc. YouTube channel.

8.5.12 Twitter Timeline

The Twitter Timeline Widget Template enables a timeline for a specific Twitter user to be embedded on a Dashboard. The TwitterWidgetID Input Variable is a unique code that you will need to create, through Twitter. This code links through to the account whose timeline you are showing.

To generate the TwitterWidgetID you will need a Twitter Account. Go to <https://twitter.com/settings/widgets> and create a new Widget. Input the username for the user whose timeline is to be displayed and set other options. Then press “Create Widget”.

Once the Widget has been created there are two ways to get the TwitterWidgetID. The first is from the site URL. Copy the URL which will look something like the following https://twitter.com/settings/widgets/688882464815624192/edit?focus_textarea=1¬ice=WIDGET_CREATED the highlighted part is the TwitterWidgetID.

The second way is to copy the text from the Copy and Paste section generated by Twitter. In the data-widget-id=“688882464815624192” you’ll find the TwitterWidgetID.

The TwitterWidgetID of “688882464815624192” can be used as an example. This will show the Aquatic Informatics [@AQUARIUSInfo](#) Twitter Timeline.

8.6 WebPortal Scripting

The AQUARIUS WebPortal Scripting environment uses the AQUARIUS SupaScript Language. Please see the separate *AQUARIUS SupaScript Reference Manual*¹ for more details. Within AQUARIUS WebPortal, there are additional built-in functions that extend the core SupaScript language.

¹ *AQUARIUS SupaScript Reference Manual* is normally provided as part of the standard documentation set that is included in the documentation section of the AQUARIUS WebPortal installation package.

8.6.1 WebPortal Script Types

WebPortal Scripts are created based on a Type. The Type specifies how the Script will be used within the WebPortal and specifies some of the expected behaviour of Scripts.

One of the Script types is the “Common” type. It is used to store uncollected Script functions that can be referenced by any other Script Type. For the Common scripts, an unlimited number of functions with any definition is able to be created.

For all other types of Scripts, only a single function can be added to each Script and the definition must match an interface specified for each type. These Scripts can reference any Common function to reduce repeated-code.

Technical information on how each of the Script Types works is available below. For more information on what each of the Script Types is use for, see section 4.8.1.

8.6.1.1 Alert Trigger

Alert Triggers can be used to create custom functions that can be assigned as Triggers for an Alert.

Alert Triggers must comply with a specified interface. When a new Alert Trigger is created the Script will be pre-filled with the following code:

```
Function NewAlertTriggerFunction(ByVal SubState As String, ByVal StateInfo
As String) As Dictionary Dictionary alertTokens

    alertTokens.Add("ErrorMessage", "")
    alertTokens.Add("TriggerState", "")
    alertTokens.Add("TriggerStateInfo", StateInfo)
    alertTokens.Add("TriggerSubState", SubState)
    alertTokens.Add("WarningMessage", "")

    NewAlertTriggerFunction = alertTokens
End Function
```

An Alert Trigger must have the following features:

- A string value argument called SubState
- A string value argument called StateInfo
- Optional: Additional arguments of type string (third argument onwards)
- Returns a Dictionary object
 - Dictionary includes five base keys of “ErrorMessage”, “TriggerState”, “TriggerStateInfo”, “TriggerSubState”, “WarningMessage”

Triggering the Alert is based on setting the “TriggerState” to either “Normal”, “Error” or “Alert”, any other state will be considered a null.

8.6.1.2 Data Table

Data Tables are used to return tabulated data which can be displayed in Widgets on Dashboards. For more information on specific uses see section 4.8.1.

Data Tables must comply with a specified interface. When a new Data Table is created the Script will be pre-filled with the following code:

```
Function NewDataTableFunction(ByRef Error As String) As DataTable
    DataTable dt
    NewDataTableFunction = dt
End Function
```

A Data Table must have the following features:

- A string reference argument called Error (first argument)
- Optional: Additional arguments of type string (second argument onwards)
- Returns a DataTable object

8.6.1.3 Info Request

Info Requests are Scripts which are called through the user-interface and via email and text message (SMS). They return text which can be formatted with spacing and new-lines. For more information on specific uses of Info Requests see section 4.8.1.

Info Request Scripts must comply with a specified interface. When a new Info Request is created the Script will be pre-filled with the following code:

```
Function NewInfoRequestFunction(ByRef Error As String) As String
    NewInfoRequestFunction = "Test message"
End Function
```

An Info Request must have the following features:

- A string reference argument called Error (first argument)
- Optional: Additional arguments of type string (second argument onwards)
- Returns a String

An example workflow on creating an Info Request is available in section 7.3.2.

8.6.1.3.1 Usage

The body of an Info Request would typically contain Database Queries, Time-Series or meta-data requests. The information is then formatted for display back to the user.

Info Requests can be run through the Reports tab and via email and text message (SMS) request. The function name in lower-case becomes the 'verb' used to call the function.

For example, a function with the following definition:

```
Function RegionRep(ByRef Error As String, ByVal Region As String) As String
```

Would be called by issuing the following command:

```
regionrep north
```

The function name in lower-case has been used, anything entered after the verb is split based on spaces and treated as an argument. "north" would be sent through as the Region. To avoid splitting a value with spaces wrap quotations marks around it. For example, "Stage.Field Visits@Location".

8.6.1.4 Location – State Calculation

Location – State Calculation Scripts are used in the background-process of AQUARIUS WebPortal to calculate text-based States against Locations. For more information on specific uses see section 4.8.1.

Location – State Calculation Scripts must comply with a specified interface. When a new Location – State Calculation Script is created the Script will be pre-filled with the following code:

```
Function NewLocationStateCalcFunction(ByRef Error As String, ByVal LocationID As String) As String
    NewLocationStateCalcFunction = "STATE"
End Function
```

A Location – State Calculation must have the following features:

- A string reference argument called Error (first argument)
- A dictionary reference argument called StateInfo (second argument)
- A string value argument called LocationID (third argument)
- Optional: Additional arguments of type string (fourth argument onwards)
- Returns a String
 - By convention this would usually be a single-word in capital letters

8.6.1.5 Time-Series - State Calculation

Time-Series – State Calculation Scripts are used in the background-process of AQUARIUS WebPortal to calculate text-based States against Time-Series. For more information on specific uses see section 4.8.1.

Time-Series – State Calculation Scripts must comply with a specified interface. When a new Time-Series – State Calculation Script is created the Script will be pre-filled with the following code:

```
Function NewTimeSeriesStateCalcFunction(ByRef Error As String, ByRef
StateInfo As Dictionary, ByVal SeriesID As String) As String
    NewTimeSeriesStateCalcFunction = "STATE"
End Function
```

A Time-Series – State Calculation must have the following features:

- A string reference argument called Error (first argument)
- A dictionary reference argument called StateInfo (second argument)
- A string value argument called SeriesID (third argument)
- Optional: Additional arguments of type string (fourth argument onwards)
- Returns a String
 - By convention this would usually be a single-word in capital letters

An example workflow on creating an Legend using States is available in section 7.3.5.

8.6.1.5.1 Usage

State Calculations are run as background processes. The State Calculation function is called on a per Time-Series basis. The Time-Series identifier (Parameter.Label@Location) is passed in as the SeriesID. The SeriesID would then usually be used to either, request the Time-Series and perform some analysis, or request the Time-Series meta-data for comparison or evaluation.

The Script function should return a string, which by convention is a single-word, that is then stored in the database.

If a Script returns null the value won't be stored in the database, any current State Values for the Time-Series will be deleted. If a Script returns an Error, the built in "ERROR" state will be stored and the Error information will be added to the table.

8.6.2 Predefined WebPortal Scripting Functions

8.6.2.1 BeyondThresholdCheck()

```
Function BeyondThresholdCheck(    ByVal SeriesId As String,
                                ByVal Threshold As Float,
                                ByVal IsAbove As Bool = True) As Dictionary
```

Returns a Dictionary containing the following information:

Key Name	Description
Error	Error message, if an error has occurred
LatestMeasurementTime	Latest measurement time
LatestMeasurementValue	Latest measurement value
LatestRateOfChange	Latest rate of change (in units per second)
PreviousExtremeTime	Time of any previous peak or trough whilst current value has remained beyond threshold (ie: within current extreme event).
PreviousExtremeValue	Value of any previous peak or trough whilst current value has remained beyond threshold (ie: within current extreme event).
ThresholdBreached	Indicates whether value is currently beyond threshold
ThresholdValue	Threshold value (same as value passed to the method)

This method can be used in sophisticated state calculations based on values breaching (either going above or below) specified thresholds. For flooding applications this method can be used to detect the following:

- **Likely to flood**
Use rate of change to see if threshold likely to be exceeded soon.
- **Flooded**
When ThresholdBreached returns True.
- **Flooded/Peaked**
When PreviousExtremeTime and PreviousExtremeValue are not null.
- **Flooded and rising again above previous peak**
When LatestMeasurementValue is above PreviousExtremeValue.

8.6.2.2 DatabaseQuery()

Function DatabaseQuery(ByRef sErr As String, ByVal sSQL As String) As DataTable

Returns a DataTable containing the results from the specified SQL query.

8.6.2.3 GetTimeSeriesData()

**Function GetTimeSeriesData(ByRef sErr As String,
ByVal sSeriesDef As String,
ByVal sStart As String,
ByVal sFinish As String) As String**

Returns a CSV list of time-series data values from specified time-series definition as CSV text with each record on a new line and each line containing tab separated fields.

8.6.2.4 GetTimeSeriesList()

**Function GetTimeSeriesList(ByRef sErr As String,
ByVal sLocID As String=null,
ByVal sParamID As String=null) As DataTable**

Returns a DataTable containing a list of summary meta-data information for specified time-series DataSets.

The columns available in the resulting DataTable are listed below in Table 16:

Column Name	Description
SeriesID	Time-series identifier (ParamID.Label@LocID)
LocationIdentifier	Location Identifier
ParameterID	Parameter Identifier
ParameterDisplayId	Parameter DisplayId
SeriesLabel	Time-series Label
Units	Time-series Units
StartTime	Time-series StartTime
EndTime	Time-series EndTime
TotalSamples	Total number of Time-series samples
LastUpdated	Date/Time (UTC) that time-series was last updated
LocationName	Name of time-series Location
BlackListTime	Time when time-series was blacklisted (null if time-series not blacklisted)
BlacklistReason	Reason time-series was blacklisted (normally null, only set if BlackListTime is not null)
BlacklistBy	Name of person who blacklisted the time-series (normally null, only set if BlackListTime is not null)
SeriesIsActive	Indicates whether Time-series is Active or not
LocationIsActive	Indicates whether Location is Active or not
DatasetId	Unique numeric database identifier for the time-series dataset

Table 16: DataTable Columns returned by GetTimeSeriesList() function

8.6.2.5 GetTimeSeriesProperties()

**Function GetTimeSeriesProperties(ByRef sErr As String,
ByVal sSeriesID As String) As Dictionary**

Returns a Dictionary containing meta-data associated with the specified time-series DataSet.

The keys available in the resulting Dictionary are listed below in Table 16:

Key Name	Description
DataSet.SeriesID	Time-series identifier (ParamID.Label@LocID)
DataSet.LongSeriesID	Long time-series identifier (DisplayID.Label@LocID)
DataSet.DisplayName	Descriptive Name for time-series dataset
DataSet.Parameter	Time-series parameter identifier
DataSet.Label	Time-series label
DataSet.Location	Time-series location identifier
DataSet.Unit	Time-series unit
DataSet.StartTime	Time-series start time
DataSet.EndTime	Time-series end time
DataSet.TotalSamples	Total samples in time-series
DataSet.LastModified	Last modified date/time (UTC)
Location.Identifier	Location identifier
Location.LocationPath	Location folderpath
Location.Name	Location Name
Location.DisplayName	Descriptive Name for Location
Location.LocationTypeName	Location Type
Location.Latitude	Location Latitude
Location.Longitude	Location Longitude
Location.UTCOffset	Location UTCOffset
Parameter.DisplayId	Parameter DisplayId
Parameter.Name	Parameter Name
DataSet.Description	Time-series description

Table 17: Dictionary Keys returned by GetTimeSeriesProperties() function

8.6.2.6 GetTranslatedText()

**Function GetTranslatedText(ByVal sXMLTranslationList As String,
ByVal sLanguageCode As String = null) As String**

Used to extract required language translation from an XML list of translations that are available in some database fields (eg: Parameter Name, Statistic Display Name). Returns the translation for the specified language code. If the language code is null or not matched, the first available translation is returned.

8.6.2.7 SeriesStateList()

**Function SeriesStateList(ByRef Error As String,
ByVal StateType As String,
ByVal StateFilter As String = "",
ByVal ParamFilter As String = "") As DataTable**

Returns a DataTable containing a list of calculated state values for the specified State Type. Results can be filtered to only return results for a specified state value (StateFilter) and/or parameter (ParamFilter).

The columns available in the resulting DataTable are listed below in Table 16:

Column Name	Description
SeriesID	Time-Series Identifier (ParamID.Label@LocID)
StateName	State Name/Type (from State Definition)
StateValue	State Value
StateLastUpdated	Time of last State update (UTC)
BOR	Beginning of Record (Start Time) for time-series
EOR	End of Record (End Time) for time-series
SeriesLastUpdated	Time of last time-series update (UTC)
SeriesTimeZoneBias	Time-zone bias for time-series
LocationUTCOffset	UTC offset for Location
LocationName	Location Name
Latitude	Location Latitude
Longitude	Location Longitude
Elevation	Location Elevation
ParameterName	Time-series Parameter Name
Units	Time-series Units

Table 18: DataTable Columns returned by SeriesStateList () function

8.7 Alert Trigger Functions

Alert Trigger functions are used to trigger **Alerts** (see section 4.5.6) resulting in **Notifications** being sent out to people listed in associated **Distribution Groups**.

Alert Trigger Functions also return a lot of contextual information that may be inserted as message tokens with Notification messages so that the content of an Alert message can be quite dynamic based on values returned by the trigger function.

8.7.1 LatestStatCheck Alert Trigger

The LatestStatCheck Alert Trigger function will read the value of any computed “Latest” statistic for specified Time-Series and test against the specified condition.

Normally this function would be used with a single Time-Series, Statistic and condition, however provision is made for multiple tests to be performed on multiple Time-Series and Statistics.

Syntax:

```
LatestStatCheck(    ByVal SeriesIdList As String,
                   ByVal StatNames As String,
                   ByVal TriggerConditions As String)
```

Examples:

```
LatestStatCheck( "Stage.Telemetered@A742135",  
                "LatestValue",  
                ">3.75")
```

An Alert will be triggered if the "LatestValue" statistic for Time-Series Stage.Telemetered@A742135 has exceeded a value of 3.75.

```
LatestStatCheck( "Stage.Telemetered@A742135,  
                Stage.Telemetered@A742139",  
                "LatestValue, LatestValue",  
                ">3.75, >4.30")
```

An Alert will be triggered if either of the following occurs:

- The "LatestValue" statistic for time-series Stage.Telemetered@A742135 has exceeded a value of 3.75
- The "LatestValue" statistic for time-series Stage.Telemetered@A742139 has exceeded a value of 4.30

8.7.2 LatestStatGroupCheck Alert Trigger

The LatestStatGroupCheck Alert Trigger function will perform in a similar way to the LatestStatCheck trigger however it will check a single statistic for all time-series within a specified list of Location folders. By default, an alert will be triggered if just 1 of the time-series within the specified group satisfies the specified statistic condition.

Syntax:

```
LatestStatGroupCheck( ByVal SeriesGroup As String,  
                    ByVal StatName As String,  
                    ByVal TriggerCondition As String,  
                    ByVal ReportMax As Bool = True,  
                    ByVal MinOccurs As Int = 1)
```

Examples:

```
LatestStatGroupCheck( "Region:North,West",  
                    "HEAVIEST1hx24",  
                    ">20")
```

This alert might typically be used to trigger when high rainfall intensities at any location within 1 or more regions. Assuming you have created a statistic named 'HEAVIEST1hx24' to calculate maximum hourly rainfall (or precip) intensities for past 24 hours, the alert definition above will be triggered if any time-series within the North or the West regions have an hourly intensity value greater than 20.

8.7.3 StatCheck Alert Trigger

The StatCheck Alert Trigger function is similar to the LatestStatCheck function but is restricted to just single input, statistic and test condition, however it provides the following additional flexibility:

1. The input may be an AQUARIUS Data Set Identifier, or a more complex time-series specification.
2. The statistic needs to be fully specified and is calculated as part of the trigger evaluation (rather than being pre-computed as in the case of the LatestStatCheck function)

Syntax:

```
StatCheck(          ByVal InputSeries As String,  
              ByVal Statistic As String,  
              ByVal TriggerCondition As String)
```

Example:

```
StatCheck(          "Stage.Telemetered@A742135",  
              "GetValue(EOR)",  
              ">3.75")
```

An Alert will be triggered if the result of GetValue(EOR) calculation for Time-Series [Stage.Telemetered@A742135](#) has exceeded a value of 3.75.

8.7.4 SeriesStateCheck Alert Trigger

The SeriesStateCheck Alert Trigger will read a calculated state value from a specified Time-Series and will check against one or more trigger values.

Syntax:

```
SeriesStateCheck(  ByVal SeriesID As String,  
                  ByVal StateDefinitionID As String,  
                  ByVal TriggerStatusValues As String)
```

Example:

```
SeriesStateCheck(  "PP.E2126@40796","DataCurrency","Overdue,NoData")
```

An Alert will be triggered if the computed "DataCurrency" state of the specified Time-Series is either "Overdue" or "NoData".

8.7.5 SeriesStatStateCheck Alert Trigger

This trigger function applies only to states based on defined Parameter Ranges (see section 4.5.6). The SeriesStatStateCheck Alert Trigger will:

1. Read a calculated latest statistic value for a specified Time-Series;
2. Compute the associated state value for the retrieved statistic value based on a specified state definition;
3. Compare the computed state value with the specified list of trigger values.

Syntax:

```
SeriesStatStateCheck( ByVal SeriesID As String,  
                      ByVal StateDefinitionID As String,  
                      ByVal TriggerStatusValues As String,  
                      ByVal Stat As String)
```

Example:

```
SeriesStatStateCheck( "HG.E1525@540130",  
                      "MMMSTATE",  
                      "MODERATE,MAJOR",  
                      "LATEST")
```

An Alert will be triggered if the specified statistic value corresponds to a state of either "MODERATE" or "MAJOR".

8.7.6 LocationStateCheck Alert Trigger

The LocationStateCheck Alert Trigger will read a calculated state value from a specified Location and will check against one or more trigger values.

Syntax:

```
LocationStateCheck( ByVal LocationID As String,  
                    ByVal StateDefinitionID As String,  
                    ByVal TriggerStatusValues As String)
```

Example:

```
LocationStateCheck("73"," FLOODPRONEROAD","FLOODED")
```

An Alert will be triggered if the computed "FLOODPRONEROAD" state of the specified Location (Identifier=73) is currently set to "FLOODED".

8.8 String Formatting

Sections of the AQUARIUS WebPortal, including the Statistic Summaries and Alert Templates, will use a formatted string to display messages. These formatted strings are used to create a common string template where values are added dynamically. This is useful for displaying the data in a meaningful way.

The Format Strings are written as normal text, and when a token is to be included that value is inserted as a number surrounded by curly brackets (e.g. "{0}" will insert token "0").

Consider a scenario where the tide level of a location is to be reported in an Alert. We would like the Alert to have a message with the following format:

[Location]: [Parameter] is at [Value][Unit]

To create this format string, we simply replace our tokens with the curly bracket placeholders:

{0}: {1} is at {2}{3}

The value of the placeholders is then defined in AQUARIUS WebPortal. Any number of tokens can be chosen and inserted, and tokens can be inserted multiple times. For our scenario we have chosen the location, parameter, value and unit tokens as shown in Figure 144.

Token Number	Token Name	Actions
+ 0	Location Name	[trash icon]
+ 1	Parameter Name	[trash icon]
+ 2	Statistic Value	[trash icon]
+ 3	Series Unit	[trash icon]

Alert Triggered - Message Definition: {0}: {1} is at {2}{3}

Alert Triggered - Message Definition has 21 characters

Test Message

Figure 144: Simple Alert Message

This will generate the following message:

Brisbane River Mouth: Tide Level AHD is at -0.146616383333333m

Where: Location = Brisbane River Mouth,
 Parameter = Tide Level AHD,
 Statistic Value = -0.146616383333333,
 Series Unit = m

It is unlikely that a message requires the Statistic Value to fifteen decimal places. String formatting also allows us to format the values of our tokens. This is particularly useful for setting the number of decimal places in numeric values and for setting the format of a date.

To format a string, the user can add the formatting details after a colon in the token declaration as below:

{0}: {1} is at {2:0.00}{3}

The user can indicate how many significant digits to display before and after the decimal point. If the number “00.00” were used, our value would be displayed as “-00.14”.

To format dates the years, months, days, hours, minutes and seconds can be entered into the format string in the desired order. If we now reduce the decimal places of our last example to two and add a date, we can have the following string

{0}: {1} is at {2:0.00}{3} on {4:yyyy/MM/dd hh\:mm\:ss}

The Date Value (number 4) in this example has been defined in the following format:

[Years]/[Months]/[Days] [Hours]:[Minutes]:[Seconds]

The number of significant digits can also be defined here in the same way as the numerical format strings. Note that the hours, minutes and seconds have two letters to represent two significant digits. This will then display the eighth hour of the day as “08”, whereas a single letter “h” will result in “8”. The above format string will result in the following message:

Brisbane River Mouth: Tide Level AHD is at -0.15m on 2014/10/28 08:22:20

NOTE: When formatting the dates and a colon is used in the format, a backslash should be inserted before the colon. This is used to distinguish the colon in the format string with the colon used to indicate the start of the format string. The backslashes will be removed when the string is formatted.

To split our date and time into sections, the same parameter can be inserted multiple times. To insert text between the date and time, the following string can be used. Note the “tt” in the string that denotes the AM/PM designator.

{0}: {1} is at {2:0.00}{3} on {4:yyyy/MM/dd} at {4:h\:mmtt}

Result: **Brisbane River Mouth: Tide Level AHD is at -0.15m on 2014/10/28 at 8:22AM**

Dates can also be formatted to display the abbreviated or full month name by using three or four “M” symbols respectively. The day of the week can be included in a similar fashion, where three or four “d” symbols display the abbreviated or full day of the week respectively.

Figure 145 displays an alert which has been configured to display the Trigger State, Location and Parameter, Statistic Value and Unit, and Time and Date. This format string with these parameters yields the following message:

**[Normal] Brisbane River Mouth: Tide Level AHD will be -0.15m
on Tuesday 28 October at 8:22:20AM**

Alert Messages + Add Alert Token

Token Number	Token Name	Actions
+ 0	TriggerState	<input type="button" value="🗑️"/>
+ 1	Location.Name	<input type="button" value="🗑️"/>
+ 2	Parameter.Name	<input type="button" value="🗑️"/>
+ 3	Statistic.Value	<input type="button" value="🗑️"/>
+ 4	Series.Unit	<input type="button" value="🗑️"/>
+ 5	Statistic.TimeStamp	<input type="button" value="🗑️"/>

Alert Triggered - Message Definition: Alert Triggered - Message Definition has 63 characters

Alert Un-Triggered - Message Definition: Alert Un-Triggered - Message Definition has 0 characters

Define Alert Messages above and add at least one Alert - click 'Test Message', the first alert will be used to test the returned messages.

Figure 145: Alert Message with Tokens

If a UTC offset is to be used another format string must be specified. While the offset value can have a sign (“+” or “-“) when the string is formatted the sign is removed. To display the sign, it must be included separately and formatted with the “sn” specifier as below:

UTC{1:sn}{1:hh}\:mm}

For a token of “-10.00:00” this will display as “UTC-10:00”. Without the “sn” specifier, formatting the token will result in the sign being removed. An example Statistic Summary Format String is shown below displaying a time with a UTC offset.

Define Summary Values

Format String: {0:h\;dd\;sst} at UTC{1:s}{1:hh\;mm}

+ Add Value

Number	Statistic	Value	Actions
+ 0	Latest Measurement	Timestamp	[icon]
+ 1	Latest Measurement	UTC Offset (Nullable)	[icon]

Test Statistic Summary

✓ Format String is specified correctly!

Summary Message: 6:27:58PM at UTC-02:00

Test Values:
 (0) = 10/27/2014 6:25:58 PM
 (1) = -02:00:00

Figure 146: Statistic Summary Format String

8.9 HTML Codes

Text written on Web Sites that includes symbols needs to use special HTML codes. As an example, to achieve the degree symbol with Celsius (°C) or Fahrenheit (°F) HTML codes can be used for characters and symbols.

Example: 25°C will be displayed as 25°C

These codes are useful for display text that is used in Legends and Statistic Summaries. They are also useful for messages displayed on the WebPortal, including Copyright and Trademark messages.

HTML codes follow the pattern beginning with an ampersand (&) character and ending with a semi-colon (;)

A summary of common units used with data are presented in the table below:

Characters and Symbols	HTML Code	Plain name
°	°	Degree sign
±	±	Plus-minus sign
²	²	Squared sign
³	³	Cubed sign
μ	µ	Micro sign
½	½	Fraction (half)
©	©	Copyright sign
®	®	Registered Trademark sign
™	™	Trademark sign

Table 19: Common equation characters and symbols

For a full list of codes use the following reference link: <http://www.ascii.cl/htmlcodes.htm>

8.10 Icons (Font-Awesome)

Icons are used throughout the WebPortal to give a visual indicator for links and buttons and to high-light or bring attention to certain things (such as alerts).

They can also be used in text defined by Admins in things such as Announcement Banners and Disclaimer messages.



Figure 147: Example Icons used for WebPortal Navigation

To use these icons in text use the following line of text below:

```
<span class='fa fa-ICON'></span>
```

An example Announcement Banner is shown below:

```
<span class='fa fa-exclamation-triangle'></span> Test Icon display
```



Figure 148: Announcement Banner with Icon

Changing the 'exclamation-triangle' to 'bullhorn' changes the banner as follows:

```
<span class='fa fa-bullhorn'></span> Test Icon display
```



Figure 149: Announcement Banner with new Icon

Full details of the all the icons can found here: <http://fontawesome.io/icons/>

NOTE: Icons are provided through a service called Font-Awesome which comes installed with AQUARIUS WebPortal. Font-Awesome Version 4.6.3 is used which includes 634 unique icons.

fa-area-chart



Unicode: f1fe · Created: v4.2

To check whether an icon can be used, click on it and make sure the Created Version is 4.5 or below, as with the 'fa-area-chart' example above.

New versions of AQUARIUS WebPortal will keep Font Awesome up-to-date.

8.11 Permalinks

AQUARIUS WebPortal allows for navigation directly to any section by typing in a URL. The URLs are designed to be simple and human-readable for the purpose of sharing via email or text message (SMS) or bookmarking the URL's for future reference.

The links will include details of the section being viewed, the current tab and filters options selected. When viewing an Edit Data Entry Form for an item, the link will include the database Id for that item, allowing navigation directly back to the Edit Data Entry Form.

8.11.1 Data Section

To navigate directly to a tab within the Data Section, use the URLs below:

Tab	URL
Map	/Data/Map
Map Grid	/Data/MapGrid
Location Overview	/Data/LocationOverview
Data Set Overview	/Data/DatasetOverview
Charts	/Data/Chart
Alerts	/Data/Alert
Reports	/Data/Report

Table 20: Data Section Permalinks

NOTE: Permalinks are not currently usable on Dashboards displayed in the Data Section.

The links above allow for direct navigation to tabs within the data section. For the Data Set Overview tab you are able to go directly to a sub-tab. This is optional when navigating directly into the Data Set Overview.

Tab	URL
Summary	/Data/DatasetOverview/Summary
Chart	/Data/DatasetOverview/Chart
Grid	/Data/DatasetOverview/Grid
Statistics	/Data/DatasetOverview/Statistics

Table 21: Data Set Overview Permalink Options

Controls available on these tabs will be set to their defaults. These defaults can be overwritten by adding these filters onto the end of the WebPortal address.

Controls	URL	Map	Map Grid	Location	Data Set	Chart	Alerts	Reports
Parameter	/Parameter/ PARAMETER	x	x					
Parameter and Statistic	/Parameter/ PARAMETER /Statistic/ STATISTIC	x	x					
Interval	/Interval/ INTERVAL	x	x	x	x	x	x	
Interval with Year	/Interval/ INTERVAL/YEAR	x	x	x	x	x	x	
Interval with Month	/Interval/ INTERVAL/YEAR/MONTH	x	x	x	x	x	x	
Interval with Day	/Interval/ INTERVAL/YEAR/MONTH/DAY	x	x	x	x	x	x	
Location	/Location/ IDENTIFIER			x	x			
Location and Dataset	/Location/ IDENTIFIER/Dataset/PARAMETER/LABEL				x			
Chart	/ChartId/ IDENTIFIER					x		
Info Request	/InfoRequest/ IDENTIFIER							x
Info Request with Arguments	/InfoRequest/ IDENTIFIER/ARGUMENTS							x

Table 22: Data Section Permalink Options

For example, to show the Maximum 24 hour Statistic for the Stream Height in the Map Grid, use an address like the example below:

/Data/MapGrid/Parameter/Stage/Statistic/MAX24H

- “Stage” being the Identifier for the Stream Height Parameter
- “MAX24H” being the Identifier for the Maximum 24 hour Statistic Definition

8.11.1.1 Additional Rules

The Interval control can be appended to any of the other controls as per the examples below.

/Data/Map/Parameter/Stage/Statistic/AVG/Interval/Monthly/2014/01

- The Average Monthly Stream Heights for January 2014

8.11.1.2 Special Map-Only Rules

Additional Map-Only options are available that help to find locations.

Action	URL
--------	-----

Centre on a Location at the default Zoom Level	/Location/ IDENTIFIER
Centre on a Location at a specified Zoom Level	/Location/ IDENTIFIER/Zoom/LEVEL
Centre on a Dataset at the default Zoom Level	/Location/ IDENTIFIER/Dataset/PARAMETER/LABEL
Centre on a Dataset at a specified Zoom Level	/Location/ IDENTIFIER/Dataset/PARAMETER/LABEL/Zoom/LEVEL
Centre on Coordinates at the default Zoom Level	/Coordinates/ LONGITUDE/LATITUDE /Coordinates/ EASTING/NORTHING
Centre on Coordinates at a specified Zoom Level	/Coordinates/ LONGITUDE/LATITUDE/Zoom/LEVEL /Coordinates/ EASTING/NORTHING/Zoom/LEVEL

Table 23: Map-Only Permalinks

8.11.2 Account Section

To navigate directly to a tab within the Account Section, use the URLs below:

Tab	URL
Account Overview	/Account/Overview
Manage Account	/Account/Manage
Account Settings	/Account/Settings
Change Password	/Account/Password

Table 24: Account Section Permalinks

To sign in or out of the WebPortal use the URLs below:

Action	URL
Sign In	/Account/SignIn
Sign Out	/Account/SignOut

Table 25: Sign In/Out Permalinks

8.11.3 Admin Section

To navigate directly to a tab within the Admin Section, use the URLs below:

Group	Tab	URL
Location and Folders	Locations	/Admin/Location
	Location Types	/Admin/LocationType
	Folders	/Admin/Folder
	Folder Types	/Admin/FolderType
	Annual Frequency Types	/Admin/AnnualFrequencyType
Parameters and Units	Annual Frequency Definitions	/Admin/AnnualFrequency
	Parameters	/Admin/Parameter
	Parameter Range Definitions	/Admin/ParameterRangeDefinition
	Units	/Admin/Unit
Data Sets	Unit Groups	/Admin/UnitGroup
	Data Sets	/Admin/Dataset
	Data Sets Blacklist	/Admin/Blacklist
	Data Set Reference Types	/Admin/DatasetReferenceType

	Data Set Reference	/Admin/DatasetReference
Dashboards and Charts	Dashboards	/Admin/Dashboard
	Widgets	/Admin/Widget
	Widget Templates	/Admin/WidgetTemplate
	Charts	/Admin/Chart
Statistics and Legends	Statistic Definitions	/Admin/StatisticDefinition
	Statistic Summaries	/Admin/StatisticSummary
	Statistic Summary Groups	/Admin/StatisticSummaryGroup
	Legends	/Admin/Legend
	Legend Styles	/Admin/LegendStyle
	State Definitions	/Admin/StateDefinition
	Heat Map Definitions	/Admin/HeatMapDefinition
Alerting and Notifications	Alerts	/Admin/Alert
	Alert Templates	/Admin/AlertTemplate
	Distribution Groups	/Admin/DistributionGroup
	Notifications	/Admin/Notification
Security	People	/Admin/People
	Security Roles	/Admin/SecurityRole
	View Groups	/Admin/ViewGroup
	Audit Logs	/Admin/Audit
Scripts and Extensions	Scripts	/Admin/Script
Global Settings	Global Settings	/Admin/GlobalSettings

Table 26: Admin Section Permalinks

8.11.3.1 Create or Edit an Item

To navigate directly to the create data entry form for an item in the Admin Section append /Create/ to the end of the address, for example:

`/Admin/LocationType/Create`

To navigate directly to the Edit Data Entry Form append /Edit/ and the Database ID to the end of the address, for example:

`/Admin/LocationType/Edit/5`

To navigate directly to the view page append /View/ and the Database ID to the end of the address, for example:

`/Admin/LocationType/View/5`

Accessing the view page can be useful for situations where a link is shared is provided to someone without Update permissions, only Read permissions.

These URLs can be obtained by pressing the Share button in the top-right corner of the tab.

To navigate directly to a Global Setting use the following address:

`/Admin/GlobalSettings/Edit/SETTINGGROUP/SETTINGKEY`

These Admin tabs have no data entry forms and will ignore requests to create or edit items:

- Data Set Blacklist
- Notifications
- Audit Logs

8.11.4 Other Sections

To navigate directly to Status pages within the WebPortal, use the URLs below:

Tab	URL
Status	/Status
Licence Status	/Licence

Table 27: Status Page Permalinks

8.11.4.1 Machine Readable Pages

Machine readable pages formatted in JSON (see section 8.13 for more information) have been set up to allow users to obtain a list of Statuses and Licences as well as access the details of a Status and the details of Licence Feature individually. More information about these pages can be found in the *AQUARIUS WebPortal System Administration Guide*.

8.12 ArcGIS Maps

There are three configurable components that define what is presented to the user. The basic structure is show below:

- Map Settings
- Base Map Groups
 - Layer Groups
 - Layers
- Overlay Groups (optional)
 - Layer Groups
 - Layers

The Base Map Groups and Overlay groups have the same structure with child “Layer Groups” and grandchild “Layers”

Configuration is done as JSON for each of the three components separately (see section 8.12 for more information).

A description of each of the three components and sub-components is provided below, followed by examples of each.

NOTE: Map URLs for the examples and defaults are all secure (https) addresses. Secure addresses work across both a secure and unsecure (http) WebPortal. Unsecure Map URLs will not work over a secure WebPortal. It is recommended that a secure Map URL is always chosen when apply Map settings.

8.12.1 Map Settings

Map settings define the visual elements of the map including: additional components and which base maps and layers are presented to a user.



Figure 150: Components, Base Maps and Layers

The map settings component is defined in Global Settings. There are two maps, the “Main” map used in the Data Section and the “Mini” map used in the Admin Section.

Setting Group	Setting Key
WebPortal.Map.Settings	Main
WebPortal.Map.Settings	Mini

Table 28: Map Global Settings

Possible setting values include:

Value	Type	Required	Description
activeBaseMapGroup	String	Yes	Specify the Map Group by identifier to be made available to the user.
activeOverlayGroups	String[]	No	Specify a list of group layers by their identifiers.
center	Number[]	Yes	The location where the map should be centred. Enter the location as an array containing longitude and latitude (for example, [-98, 40]).
zoom	Number	Yes	Initial zoom level of the map. If a value is not provided, it will be calculated based on the initial extent of the basemap.
autoResize	Boolean	Yes	Internal setting only to be modified by the vendor.
slider	Boolean	?	Displays a slider (zoom options) on the map. When false, the slider never displays.
sliderStyle	String	No	Defines the slider style. Valid values are 'small' or 'large'.
homeButton	Boolean	No	HomeButton provides a simple button to return to the map's default starting extent
locateButton	Boolean	No	LocateButton provides a simple button to locate and zoom to the user's current location.
scalebar	Object (See below)	No	The scalebar widget displays a scalebar on the map.
overviewMap	Object (See below)	No	The OverviewMap widget displays the current extent of the map within the context of a larger area

Table 29: Map Settings

The Scale Bar is an additional component with its own set of configuration options. The scale bar can be configured to show Metric or Imperial units or both and can be repositioned on the map.

The Scale Bar is an optional component, if configuration for the Scale Bar is not included it will not be displayed.

Value	Type	Required	Description
attachTo	String	?	Specify the scalebar position on the map. Valid options are "top-right","bottom-right","top-center","bottom-center","bottom-left","top-left". The default value is "bottom-left".
scalebarStyle	String	?	Specify the style for the scalebar. Valid values are "ruler" or "line". When scalebarUnit is set to dual the scalebar style will be set to line
scalebarUnit	String	No	Specify the scalebar units. Valid values are "english" or "metric" and starting at version 3.4 "dual". When using dual the scalebar displays both english and metric units. The default value is "english".

Table 30: Map Scale Bar Settings

The Overview Map is an additional component with its own set of configuration options, its opacity can be configured as well as its position on the map.

The Overview Map is an optional component, if configuration for the Overview Map is not included it will not be displayed.

Value	Type	Required	Description
attachTo	String	Yes	Specifies which corner of the map to attach the OverviewMap dijit. Valid values are: "top-right","bottom-right","bottom-left" and "top-left". The default value is "top-right".
opacity	Number	No	Opacity of the extent rectangle, defined as a number between 0 (invisible) and 1 (opaque). The default value is 0.5.

Table 31: Map Overview Settings

8.12.2 Base Map/Overlay Groups

Base Map Groups and Overlay Groups have the same definition, but are use in different ways. The Base Map Groups are used to specify a list of Base Maps that users can switch between (including Street View, Satellite Imagery, etc.). Only one Base Map can be selected at any time.

Overlay Groups are used to specify a list of Overlays that can be displayed on top of the map. These can be switched on and off by the user in any combination and can be overlaid on any of the Base Maps. An example overlay included is Wind Speed/Direction markers.

Base Map Groups are defined in the Global Settings as below:

Setting Group	Setting Key
WebPortal.Map.BaseMapGroup	DefaultMaps

WebPortal.Map.BaseMapGroup	DefaultMiniMap
WebPortal.Map.BaseMapGroup	<UNIQUE MAP GROUP IDENTIFIER>

Table 32: Base Map Global Settings

Overlay Groups are defined in the Global Settings as below:

Setting Group	Setting Key
WebPortal.Map.OverlayGroup	Weather
WebPortal.Map.OverlayGroup	<UNIQUE MAP GROUP IDENTIFIER>

Table 33: Map Overlay Group Global Settings

Two Base Map Groups and One Overlay Group are present in the standard database.

- “DefaultMaps” group includes several pre-configured base maps, including Open Street Map and a Satellite Imagery Map, amongst others. Users can switch between these dynamically when viewing maps in the Data Section.
- “DefaultMiniMap” includes a single map, Open Street Map. This map is used when a small map is displayed in the WebPortal, currently found in Admin > Locations.
- “Weather” group includes a single overlay for Wind Speed and Direction that can be switched on or off and displays over the current base map.

Value	Type	Required	Description
title	String	?	A title for the group
description	String	No	A description
layers	Object[]	?	A list of map layers. Refer to Map Layers below.

Table 34: Base Map and Overlay Settings

8.12.2.1 Layer Groups

Layer Groups defines a list of base maps that are available for the users to switch between.

These base maps may be made up of one or more layers.

Value	Type	Required	Description
title	String	Yes	A title for the group
description	String	No	A description
thumbnail	URL	No	A URL to a thumbnail image showing an example of the Map Layer
isDefault	Boolean	No	Whether this base map should the default shown when initially loaded
legendSource	Object[]	No	Reference to external Legends to be shown when the layer is shown
legends	Object[]	No	Embedded legends to show shown when the layer is shown
layers	Object[]	Yes	A list of sub layers that compose this map. Refer to Sub Layers below

Table 35: Map Layer Group Settings

Thumbnails are recommended to be 200x133px (standard ArcGIS thumbnail size). There are nine thumbnails included with the WebPortal which are preconfigured against current Base Maps. The full URL is found below each example image.

Thumbnails can be full URLs to images hosted on the Internet (including other ArcGIS thumbnails).

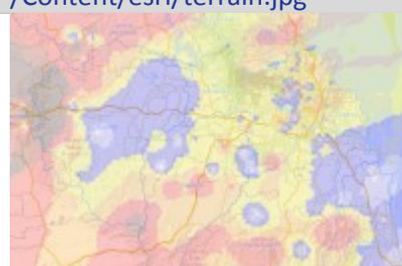
Thumbnail Options		
		
/Content/esri/openstreet.jpg	/Content/esri/satellite.jpg	/Content/esri/natgeo.jpg
		
/Content/esri/topology.jpg	/Content/esri/worldstreet.jpg	/Content/esri/terrain.jpg
		
/Content/esri/oceans.jpg	/Content/esri/physical.jpg	/Content/esri/contour.jpg

Table 36: Map Thumbnail Examples

8.12.2.2 Layers

Layers found inside the Layer Group, define the list of layers presented to the user which make up a Base Map. For example the World Terrain base map (included by default) is made up of a “Map” layer and a “Boundaries and Places” layer which contains lines for World Boundaries and labels for Place names. (Note: most maps include the boundaries and labels by default).

Value	Type	Required	Description
type	String	Yes	The type of the layer
url	URL	No	ArcGIS REST URL (Map Service) Note: Not required for Open Street Map
options	Object[]	No	Different for each type. See Online API Reference (links below)

Table 37: Map Layer Settings

Currently three Layer types are supported, additional information about configurable options for each can be found in the ArcGIS API online:

1. ArcGISTiledMapServiceLayer ([Online API Reference](#))
2. ArcGISDynamicMapServiceLayer ([Online API Reference](#))
3. ArcGISImageServiceLayer ([Online API Reference](#))
4. FeatureLayer ([Online API Reference](#))
5. OpenStreetMapLayer ([Online API Reference](#))
6. WebTiledLayer ([Online API Reference](#))
7. KMLLayer ([Online API Reference](#))
8. GeoJsonLayer ([Online API Reference](#))

8.12.2.3 Legends

Legends can be defined in two ways. The first is by using the Legend Source to reference the legend on a remote ArcGIS server. This has the benefit that any changes to the layer will result in the layer being kept up-to-date.

The second option is to directly embed the details of the legend into the JSON (including images as base 64 data). This option can be used to manually create a legend against a layer where one doesn't exist.

Multiple legends can be shown for each layer being displayed, this is especially useful where a layer being displayed is made up of multiple underlying ArcGIS layers.

8.12.2.3.1 Legend Source

Value	Type	Required	Description
type	String	Yes	The type of the Legend
url	URL	Yes	ArcGIS REST URL (Map Service)
options	Object[]	Yes	Different for each Legend type

Table 38: Map Legend Settings

The only Legend type currently supported is 'ArcgisLegendService'. ArcGIS legends return JSON with Legends for each layer defined in the map service being accessed.

The options requires a "layerIds" object which is an array of numbered ids for the legend being taken from the service. If multiple values are included in the "layerIds" field, multiple legends will be displayed for the layer.

8.12.2.3.2 Embedded Legends

Embedded legends are created by using the same JSON format as used by ArcGIS server for their legends. The basic structure is an array of objects, each of which must contain a legend object. Inside the legend object is an array with each object representing a legend band.

The basic structure of the Legend Band is a content mime type, height, width, label and the image data which is binary data converted to base 64.

8.12.3 Map Settings Example – Main Map

The Main Map example below includes all the additional components (home button, locate button, scale-bar and overview map) and references the base map and a single layer group.

Setting Group: WebPortal.Map.Settings

Setting Key: Main

```
activeBaseMapGroup: "DefaultMaps",
activeOverlayGroups: ["Weather"],
center: [0, 0],
zoom: 2,
autoResize: true,
slider: true,
sliderStyle: "large",
homeButton: true,
locateButton: true,
scalebar: {
  attachTo: "bottom-left",
  scalebarStyle: "ruler",
  scalebarUnit: "dual"
},
overviewMap: {
  attachTo: "bottom-right"
}
```

NOTE: To add the example Weather Layer add the following text into the Global Setting under the activeBaseMapGroup:

```
activeOverlayGroups: ["Weather"],
```

8.12.4 Map Settings Example – Mini Map

The Mini Map example below includes just the home button, locate button and a scale as well as referencing the Base Map Group with a single Map. It doesn't include the overview map or any Overlay Groups.

Setting Group: WebPortal.Map.Settings

Setting Key: Mini

```
activeBaseMapGroup: "DefaultMiniMap",
center: [0,0],
zoom: 10,
autoResize: true,
slider: true,
sliderStyle: "large",
homeButton: true,
locateButton: true,
scalebar: {
  attachTo: "bottom-left",
  scalebarStyle: "ruler",
  scalebarUnit: "dual"
}
```

8.12.5 Base Map Groups Example – Main Map

The Base Map Group Example for the Main Map includes two maps that users can switch between. The Open Street Map and the Satellite Imagery which is made up of two layers, the World Imagery layer (with the satellite pictures) and the World Boundaries and Places layer (with lines for jurisdictional boundaries and labels for place names).

Setting Group: WebPortal.Map.BaseMapGroup

Setting Key: DefaultMaps

```
title: "Default Maps",
description: "Default Maps",
layers: [{
  isDefault: true,
  title: "Open Street Map",
  description: "Open Street Map (OSM)",
  thumbnail: "/Content/esri/openstreet.jpg",
  layers: [
    {
      type: "OpenStreetMapLayer",
      options: {}
    }
  ]
},
{
  title: "Satellite Imagery",
  description: "Satellite Imagery (ArcGIS)",
  thumbnail: "/Content/esri/satellite.jpg",
  layers: [
    {
      type: "ArcGISTiledMapServiceLayer",
```

```

        url:
"https://services.arcgisonline.com/arcgis/rest/services/World_Imager
y/MapServer",
        options: {}
    },
    {
        type: "ArcGISTiledMapServiceLayer",
        url:
"https://services.arcgisonline.com/ArcGIS/rest/services/Reference/Wo
rld_Boundaries_and_Places/MapServer",
        options: {}
    }
]
}]

```

8.12.6 Overlay Groups Example

The Overlay Group Example for the Main Map includes a single layer “Wind Speed/Direction” which overlays arrows on the map indicating direction of wind and speed through colour.

Setting Group: WebPortal.Map.OverlayGroup

Setting Key: Weather

```

title: "Weather Layers",
description: "Weather Layers provided by ArcGis.com",
thumbnail:
http://upload.wikimedia.org/wikipedia/commons/5/52/Weather-few-
clouds.svg",
layers: [{
    title: "Wind Speed/Direction",
    description: "Current Wind Speed/Direction",
    isActive: false,
    legendSource: {
        type: "ArcgisLegendService",
        url:
"https://tmservices1.esri.com/arcgis/rest/services/LiveFeeds/NOAA_ME
TAR_current_wind_speed_direction/MapServer/legend?f=pjson",
        options: { layerIds: [0] }
    },
    layers: [{
        type: "FeatureLayer",
        url:
"https://tmservices1.esri.com/arcgis/rest/services/LiveFeeds/NOAA_ME
TAR_current_wind_speed_direction/MapServer/0",
        options: { id: "wind", outFields:["*"] }
    }
]}
}]

```

8.12.6.1 Embedded Legend Example

An alternative to the JSON presented above would remove the “legendSource” object and replace it with a “legends” object as shown below:

```
legends: [{
  legend: [{
    contentType: "image/png",
    height: 20,
    width: 20,
    label: "0 km/h (Calm / No Reading)",
    imageData: "iVBORw0KGgoAAAANSUhEUgAAABQAAAAUCAYAAACN..."
  },
  {
    contentType: "image/png",
    height: 20,
    width: 20,
    label: "< 12 km/h (Light Breeze)",
    imageData: "iVBORw0KGgoAAAANSUhEUgAAABQAAAAUCAYAAACN..."
  }
]}]
```

Within “legends” multiple Legends can be defined. Image data is binary code that has been changed to base 64.

NOTE: Legend above only shows two of its seven bands for brevity. Image data as base 64 has also been cut down for brevity.

8.13 JSON

JSON ([JavaScript Object Notation](#)) is a format used to store and send text-based information that is machine-readable. JSON is most commonly used to exchange information machine-to-machine. There are many parsers available in all major programming languages.

An example of some JSON formatted data is shown below:

```
[{
  "Id": 173,
  "Name": "Example 1",
  "Groups": ["A", "B", "C"],
  "Errors": true
},
{
  "Id": 249,
  "Name": "Example 2",
  "Groups": ["X", "Y", "Z"],
```

```
"Errors": false
}]
```

8.13.1 JSON Values

Data is defined in simple name/value pairs which consists of a field name (in double quotes if spaces are used in the name), followed by a colon, and a value. The following example defines a zoom with a numeric value of 9:

```
zoom: 9
```

JSON values can be any of the following:

- A number (integer or floating point)
- A string (in double quotes)
- A boolean (true or false)
- An object (in curly braces)
- An array (in square brackets)

8.13.2 JSON Objects

JSON Objects are written inside curly braces and can contain multiple comma separated name/value pairs:

```
scalebar: {
  attachTo: "bottom-left",
  scalebarStyle: "ruler"
}
```

8.13.3 JSON Arrays

JSON Arrays are written inside square brackets and can contain multiple values:

```
activeOverlayGroups: ["Weather", "Misc"]
```

9 Troubleshooting

If an error message is received while using AQUARIUS WebPortal or if a component is not working or behaving unexpectedly, read and follow the instructions in the error image, check the Status page (see section 5) or see the common troubleshooting steps.

If the issue is still unresolved, we recommend sending a screenshot to AQUARIUS Support for advice, see section 10.1 for more information.

9.1 Error Page

There will be times when content cannot be displayed. If changes have recently been made to AQUARIUS WebPortal components, a force refresh of the web browser may be required by pressing Ctrl+F5.

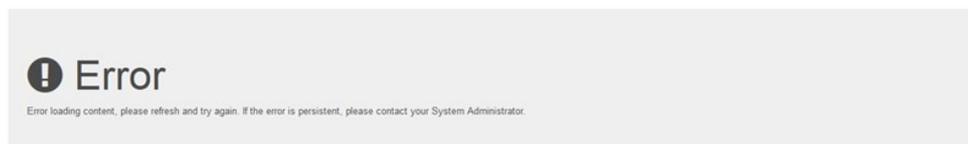


Figure 151 Loading Content Error

9.2 No Access Page

The No Access page is displayed when attempting navigating to areas of the WebPortal without the appropriate permissions. It can also be displayed after a period of inactivity where the account has automatically been Signed Out.

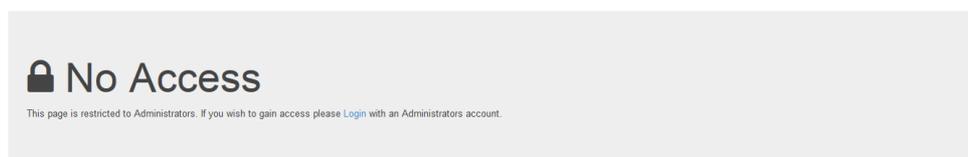


Figure 152: No Access Error

9.3 Disclaimer Rejected Page

The Disclaimer Rejected page is displayed when a user has clicked the “Reject” button on a Disclaimer popup message. When a Disclaimer is shown on the WebPortal the user must click “Accept”.

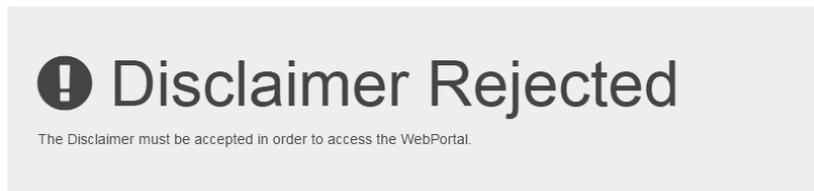


Figure 153: Disclaimer Rejected

9.4 Licence Breach Message

The Licence Breach Message indicates one of the licensable features has exceeded its set limits and is in breach of the WebPortal’s Licence. The red announcement banner is displayed at the top of the WebPortal to all users until the breach has been resolved.

For more information on why the breach has occurred, see the Licence Status Page in section 5.2.

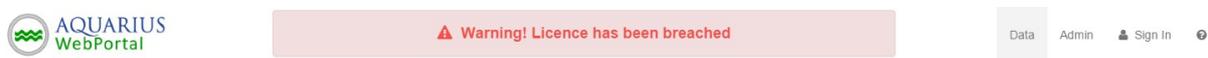


Figure 154: Licence Breach message

9.5 Map/Map Layer not loading

There are two common causes for the map failing to load: certificate validity and incompatibility between HTTP and HTTPS.

9.5.1 The Map Server is HTTPS and doesn’t have a valid certificate

To test whether the HTTPS map server has a valid certificate, browse to the map server URL. If the certificate is invalid the browser will display a message indicating the certificate is invalid and the page is potentially unsecure.

- i. *Navigate to the Admin section > Global settings and Filter Setting Group by “map”.*
- ii. *Click Filter*
- iii. *Locate the address for the map server base layer*
- iv. *Copy the URL address and paste into address bar.*

If the Map Server requires acceptance of an invalid certificate the Map Server will either need to be changed or given a valid certificate.

9.5.2 WebPortal HTTPS/Map HTTP

HTTP sites cannot be run through HTTPS as this would present a security breach. If the WebPortal is HTTPS check whether the Map or Map Layer is also HTTPS:

- i. *Navigate to the Admin section > Global settings and Filter Setting Group by “map”.*
- ii. *Click Filter*
- iii. *Locate the address for the Map Server base layer or overlay*

If the address starts with HTTP copy the address and test whether a HTTPS version of the map exists. If a HTTPS version exists this will need to be used instead.

9.6 Compatibility Mode

AQUARIUS WebPortal is designed for modern browsers, for Internet Explorer this means version 11 and above. Using Internet Explorer in Compatibility Mode is the equivalent of running the WebPortal in a browser older than Internet Explorer 11.

When running in Compatibility Mode the WebPortal will display a message in the footer as shown in Figure 155.



Figure 155: WebPortal Footer - Browser Compatibility Mode

The WebPortal is not designed to support Compatibility Mode, while it will run in Compatibility Mode, this mode is not supported by Aquatic Informatics.

10 Help and Support

AQUARIUS WebPortal Help is found through this User Manual which is available as a PDF file. There are two ways to access the User Manual from with AQUARIUS WebPortal. In the top-right corner there is a Help button in the navigation menu. Below there is a Contextual Help button in the controls menu.

- The Help button will load the User Manual at the top of the document
- The Contextual Help button will load the User Manual at the relevant section of the document (e.g. clicking from the Map will open the User Manual and navigate directly to section Error: Reference source not found)

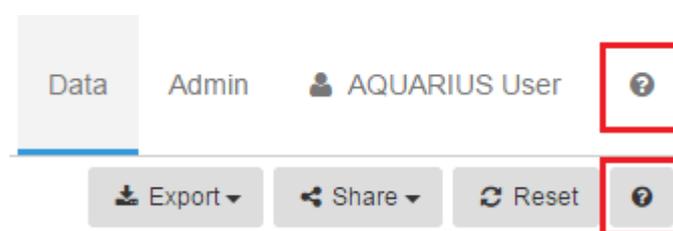


Figure 156: Help and Contextual Help buttons in the top-right corner

After clicking the help link, the default behaviour is for a new tab to open in the browser with the Adobe Acrobat Reader plugin (or equivalent).

The interactive PDF User Manual contains the following features:

- **Table of Contents/Figures/Tables:** At the top of User Manual are the three tables of Contents, Figures and Tables. Each displays all the items including their page number and allows direct navigation by clicking.
- **Cross-references:** Throughout the User Manual are references to other sections of the document (as paragraph numbers), references to figures and references to tables. These references can be used to link to those places, clicking them will navigate directly to the relevant section in the document.
- **Hierarchical Navigation:** The hierarchical navigation menu is displayed to the left as in Figure 157. This menu can be used to drill-down and navigate to any section of the document.

NOTE: The full set of User Manual features including Contextual Help and Hierarchical Navigation work best when using Adobe Acrobat Reader and the Acrobat browser plugin. While other software can view PDF files, it may not have all the navigation capabilities. We therefore recommend the use of Adobe Acrobat Reader for this User Manual.

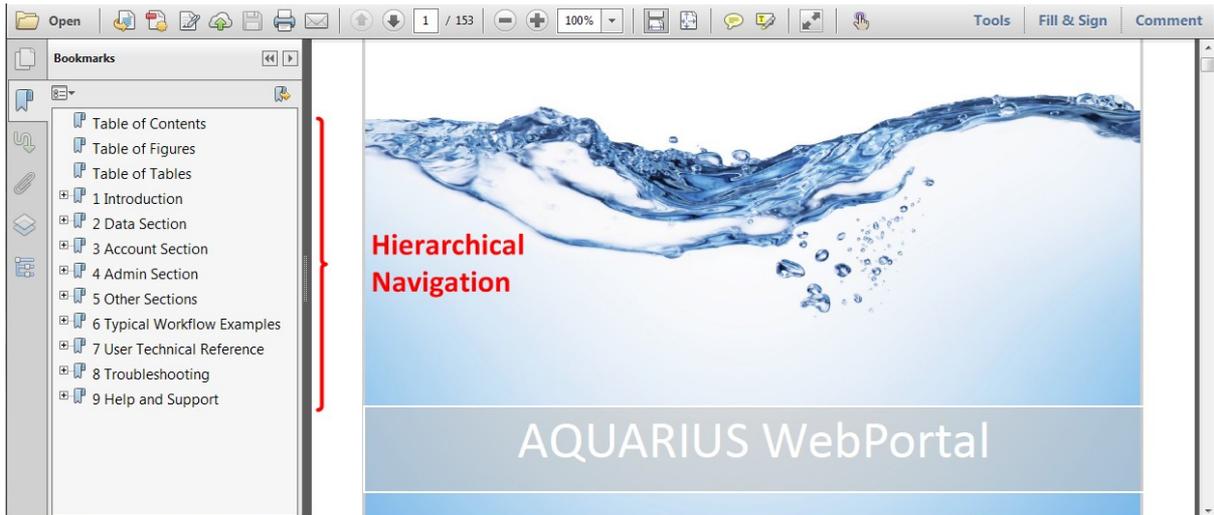


Figure 157: User Manual Hierarchical Navigation

NOTE: All AQUARIUS WebPortal User and Reference Manuals have been designed for double-sided printing.

10.1 Product Support

For all your AQUARIUS WebPortal product support needs please open a case in the [AQUARIUS 360 Support Portal](#), email support@aquaticinformatics.com or contact your local Aquatic Informatics support representative:

<p>Aquatic Informatics Inc. 2400 – 1111 West Georgia St Vancouver, B.C. V6E 4M3, CANADA tf. 1.877.870.2782 p. +1.604.873.2782 f. +1.604.873.2750</p>	<p>Aquatic Informatics Australia Pty Ltd. Level 3/18 Elizabeth St Hobart, TAS 7000 AUSTRALIA p. +61.3.6272.2229</p>
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Our company web site www.aquaticinformatics.com provides the latest up to date contact details as well as additional information about our full product suite and the range of support services available to you (including our online customer support forum).