



**Contrail<sup>®</sup>**  
User's Help and Support

**Version 6.3**  
Published: September 2016



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## About This Manual

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**Welcome!** This manual, *Conrail User's Help and Support*, offers information for Conrail users. It describes how to navigate sites, sensors, maps, graphs, and much more.

All system users can use the web to access everything the application offers; there's no client software required besides a standard web browser. Conrail's responsive and adaptive design is optimized to run across a broad set of devices, fluidly changing and responding to fit any screen or device size. Whether you're in the field, or at your desktop, you'll be able to accomplish virtually all your Conrail management tasks no matter what device you're on - desktop, laptop, tablet, smartphone - no matter what screen size.

Conrail's easy-to-use graphical interface turns your data into useful information that you can access anywhere, and at time. Encompassed are tools, graphs and reports for sensor management, rainfall and hydrologic-related reporting, maintenance, and custom alarm and notification features to support decision-critical operations.



# Chapter 1: Contrail Overview

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## User Environment

The User environment of Contrail is a read-only view of the system that allows access to Web Content, Maps, Dashboards, News, Bookmarks, Site and Sensor status and data. You may have access control through a login/password screen, or via a public website.

## Home Page

After you log into, or when you access a public Contrail website, you are brought first to the home page. The home page is made up of the following areas:

1. Branding Logo (upper left across the top). Selecting the logo opens this home page.
2. Navigation Bar (below the Branding Logo). Standard menu options are:
  - **Map** - Takes you to the Static Map, Pan and Zoom Map or provides an option for both. The System Administrator determines the functionality of this link.
  - **Sites** - Takes you to the Site List page.
  - **News** - Takes you to the News page (this option is only visible if News articles have been created).
  - **Dashboards** – List of available Dashboards (this option is only visible if the organization managing this website has created and shared Dashboards).
  - **Bookmarks**
    - Custom links created and only seen by the user account currently logged in (the bookmark links area is visible only if a bookmark has been created by the user account currently logged in).
    - **Shared** (below the user's bookmarks) - Custom links provided by the organization that owns and manages this website.
  - **Setting Gear (to the right)**
    - **User** – If you are logged in, you will see a link to your User Profile page where contact information, passwords, and bookmarks can be updated and edited. You will also see the list of User Privileges granted for your account.
    - **Administration** – Takes you to the Administration interface (this option is visible only if you have Administration privileges).
    - **Help** – Displays the application version and provides links to this help document, API information (this option is visible only if you have Administration privileges) and third party license information.
    - **Logout** option if you are logged in, or **Login** if you are not logged in yet.
3. Home Content - Web content provided by the organization that owns and manages this website.

## Chapter 2: Maps

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### Overview

Contrail Maps provide a general view of all of your sites as an overlay on the map. Your System Administrator may decide to offer both options, Static Maps as well as the Pan and Zoom map, or one or the other. There are many alternative viewing options at this overview level; in Static Maps, you can change the look of the map by removing or adding features (layers), or change the actual map through various filters allowing you to narrow your view to a specific type of sensor, map or view. In the Pan and Zoom Map, you can change the look of the map by changing the Basemap, and selecting different Overlays and filters.

If your Administrator has granted you alarm viewing privileges, you will see alarm status on the map. The site icon changes shape and color as an indication that a sensor at the site is currently in alarm. Further details of the alarm(s) can be found by selecting the site icon. Once all alarms are cleared the site icon returns to a normal indication.

If using a **Static Map**, selecting a specific site icon directs you to a screen that profiles each sensor at that site.

In the **Pan and Zoom Map**, selecting a site icon displays site information as well as a list of sensors located at that site.

The Pan & Zoom site popup uses different panels to provide site and sensor specific information.

### Site Information

Panel Icon	Description
	List of Sensors located at this site, including latest data report and status (Alarm, Time Out, Out of Service).
	Site Image.
	Site Notes.
	Link to the Site page.

### Sensor Information

Panel Icon	Description
	Displays the Sensor's 7-day sparkline graph and latest report information. When selecting this icon, a drop-down also becomes available to view Sensor Images, Notes, Thresholds, as well as Recent Rainfall for Rain Increment sensors.
	Link to the Sensor page.

## Buttons and Filters

### Static Map

#### Info (i)

This option displays a legend of the various icons and status meaning. This only applies to Static Maps.

#### Sensor Type

You can select a specific sensor type to display in the "Sensor Type" drop-down list. Use the list scroll if the list is long. The setting default is "All Sensors".

When viewing "All Sensors", hovering over a site icon profiles the Name, Site ID, and Status of the site. By selecting a unique sensor type in the list, only sites that contain that type of sensor are displayed. The last value transmitted from a sensor of that type is displayed next to the site icon. When hovering over the site icon, Site ID and Status, the Type of Sensor, Sensor ID, Reported Reading data, and Date/Time of the Reported Reading are displayed in addition to the Name.

When using Static Maps, if a specific sensor type is selected, when returning to the Static Map page, the selection is cached.

#### Rainfall Increment

In a Static Map, if you select **Rainfall Increment** for the sensor, an additional **Last Value** drop-down option appears that allows you to visually see the rainfall accumulation at all sites for a specified time period. The accumulation period can be the Last Report received, or Administrator defined accumulation periods.

#### Map Regions

In Static Maps, the "Map" filter displays your map selection choices. Most users have several maps, usually one large overview, and then maps of smaller sections of their overall area. Again, when returning to this page, the prior selection automatically appears as your first view.

#### View

The "View" filter displays different Views created by your Administrator to group sites into logical subsets.

#### Layers

In Static Maps the "Layers" drop-down list displays different map visualizations. You can select or deselect items such as Icons, Values, Topography, Water, Counties, Roads, and Cities. By default all layers are selected. Simply uncheck one or more of the available layers to remove features from the display.

### Pan & Zoom Map

In the Pan and Zoom Map, you can find different tabs of settings and options, located on the upper-right side of the screen.

Panel Icon	Description
	<b>Sites.</b> Search for Sites using the Find feature to narrow down the list of Sites. Select a Site in the list to zoom to that location on the map. Turn On/Off the Sites Names on the map. The <b>Sites Names toggle</b> is only available when no Sensor Type is selected in the Sensors panel.
	<b>Sensors.</b> Select a Sensor Type to only display sites on the map that contain Sensors of that type. After selecting a Sensor Type, you can also use the <b>Thresholds toggle</b> to have the last value label color-coded with the threshold color the sensor has reached, where applicable.
	<b>Views.</b> Choose a View. In this panel you can also easily generate a Link to your current map (with all your filters and settings), to share this map with another user by selecting the <b>Link</b> button and copying the generated URL.
	<b>Basemap.</b> Choose the Basemap.
	<b>Overlays.</b> Turn On/Off different overlays and GeoLayers made available to you, such as the National Weather Service Radar overlays.

Selecting a Site icon on the map displays a pop-up window with Site and Sensor information.

## Overlays

The Overlay options appear only if your System Administrator has requested this option. It enables you to view spatial gridded information over your area. If included in your application, there are different types of Overlays available, such as Gauge Adjusted Radar Rainfall (GARR), Radar Rainfall, Forecast Rainfall, Forecast Accumulation, and NWS Radar Mosaic. GeoLayers may also be made available by your System Administrator.

### Rainfall – StormData™ Gauge-Adjusted Radar Rainfall (GARR)

If this is included as part of your application, selecting "Radar Rainfall" displays the Gauge Adjusted Radar Rainfall (GARR) overlay on your map background. OneRain's StormData™ GARR product combines rain gauge estimates at a point with the spatially distributed information from the National Weather Service NEXRAD radars to provide information about what is happening between the gauges. The rain gauge data are used to calibrate the radar and generate rainfall estimates for each 1-km or 2-km pixel, depending on the resolution of the starting radar data. GARR data are used in flood warning, runoff modeling, I/I studies, litigation, real time control, design storms and National Pollutant Discharge Elimination System (NPDES) compliance activities. Accurate rainfall estimation is an important issue in research and engineering fields.

The traditional approach is to use rain gauges to create the spatial and temporal rainfall distribution using different interpolation algorithms. Using this technique, rainfall estimates are constrained by the sparse distribution of rain gauges in the network, and any events that occur between gauges are not captured. Radar rainfall estimates, on the other hand, can capture the entire rainfall events, but physical characteristics of radar systems and operational practices result in radar rainfall estimates that are not always consistent with ground truth. GARR estimates combine the advantages of both radar and gauges, resulting in better rainfall estimates.

**There are three types of GARR Overlays.** Radar Rainfall, Forecast Rainfall Accumulation (measurement of predicted rainfall accumulation based on Gauge Adjusted Radar Rainfall data), and Forecast Rainfall (Measurement of predicted rainfall based on Gauge Adjusted Radar Rainfall data). For each of those, you select a choice of time span.

## Rainfall – Rain Gauge Display

Rain Gauge Display Overlay is a grid derived from distance weighted averaging of rainfall using gauge data. It is available only with Contrail Base Station and Contrail Server, but not with Contrail Web-hosted services. It provides an overlay that looks similar to radar, but is generated from accumulated gauge data over various periods of time. It is typically calculated for the 15 and 30 minute, and 1, 3, 6, 12 and 24 hour accumulation periods.

## Icons

Icons on the Maps page indicate where a site or sensor is located and provide the current status of the site or sensor.

Depending on the overall site status, or the status of the sensor, the icon could change color/shape.

In Static Maps, the icon-set is selected by your System Administrator. You can view the various icons and their meaning by selecting the legend in the Tool Bar.

Status Identifier	Description
<b>Alarm</b>	Site has a current un-cleared alarm at one, or more, of its sensors (red diamond).
<b>Maintenance</b>	Site has been taken out of service by your System Administrator (orange triangle).
<b>Normal</b>	Fully Operational, no known problems (green circle).
<b>Timeout</b>	Has not received report within expected time (black triangle).
<b>Unacknowledged</b>	Site has a current un-acknowledged warning (red asterisk).

## Chapter 3: Sites

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### Overview

Selecting the "Sites" option from the Navigation Bar displays a list of all the monitoring sites viewable by your account as filtered by the filter boxes across the top (discussed below). The total number of Sites displays at the top of the list, dynamically changing based on the filters applied.

The Sites list initially by Name, in alphabetical order. Selecting the sort button, located in the header of the panel allows you to sort by Site Name or Site ID in ascending or descending order.

Selecting the name of the site links to the Site Summary page that displays the Site Information, sensors defined at that site, and information about each sensor including the most recent report and its status.

Label	Description
<b>Site</b>	Name of the Site. By selecting a specific site, you can view detailed information for that site.
<b>Site ID</b>	A unique name/number assigned to a site by the owner of the data collection system(s) located at that site.
<b>Status</b>	If a site is Out of Service, Timed Out (not reporting as expected), or in an Alarm mode a status label appears in the list next to the Site Name.

### Filters (drop down boxes)

The filters at the top of the Sites list allow you to refine the sites listed by the Type of sensor and View.

Label	Description
<b>Sensor Type</b>	The "Sensor Type" selection allows you to view sites with all types of sensors, or only display sites with specific types of sensors. When returning to this page, the selection you have made automatically appears.
<b>View</b>	The "View" selection allows you to limit the sites to a specific collection group, as defined by your System Administrator. This may be associated with a data feed from a particular agency, or a specific site may have multiple ways of receiving the data (e.g. ALERT/DIADvisor, Satellite, or IP).

### Site Summary

The Site Summary page shows a comprehensive view of a particular Site. This page also provides a quick view of all the sensors belonging to a given site; their last reported reading, and current status. Select a sensor to view more detailed information about that sensor.

Specific Site Information includes:

Label	Description
<b>Name</b>	Identifies the name of the site.
<b>Site ID</b>	A unique name/number assigned to a site by the owner of that data collection system.
<b>Sensors</b>	List of all sensors located at this site.

<b>Label</b>	<b>Description</b>
<b>Site Notes</b>	Any notes that have been defined by the System Administrator appear in a panel below the Sensors.
<b>Site</b>	Location Information and Site Image, if available
<b>Images</b>	Images of the site, if applicable.

The list of Sensors at the site includes the most recent report and its status. In the Site Summary page, selecting any sensor takes you to the Sensor Summary page. You can view Sensors in List or Tile layout. The default is defined by your System Administrator. If you select the tile icon, a 7-day sparkline graph also displays. Tile colors and icons are defined by your System Administrator. The bar chart icon in the header renders all sensors in individual graphs.

## Chapter 4: Sensors

### Overview

Selecting the "Sites" option from the navigation bar menu displays a list of all the monitoring sites viewable by your account as filtered by the drop down boxes across the top. If "Sensor Type" is not set to "All", the list shows Sites that contain a sensor of the type selected, filtered by the other drop down box (View). In addition to the Site and Sensor Name and ID, the valid data report also displays.

The Sites are listed initially by Name, in alphabetical order. Selecting the sort button located in the header of the panel allows you to sort by Site Name, Site ID, Sensor Name, Sensor ID, Reported Time and Reading in ascending or descending order.

Selecting the site name links to the Site Summary page where the Site Information is displayed. From the Site Summary page, selecting the sensor links to the Sensor Summary page where the Sensor Information is displayed.

Specific Sensor Information includes:

Label	Description
<b>Sensor</b>	Displays the Sensor Name and Sensor ID of the sensor currently selected. A dropdown list of all sensors located at the Site can be found in the breadcrumb.
<b>Site</b>	Identifies the name of the site where the sensor is located.
<b>Site ID</b>	A unique name/number assigned to a site by the owner of that data collection system.
<b>Latest Report</b>	The most recent report including the finished value, engineering units and time reported.
<b>Date Range Picker</b>	Used to define the time interval displayed in the graph and tabular data.
<b>Graph</b>	Displays an interactive time series (or hyetograph for Rain Increment sensors) for the selected time interval. See Graphs Chapter for additional information on graph controls. The duration period for this graph is a configurable setting in Contrail Base Station and Contrail Server.
<b>Thresholds</b>	If the sensor has Thresholds defined, the list of thresholds, values and color defined by the System Administrator appear below the Graph.
<b>Notes</b>	Any notes have been defined by the System Administrator appear in a panel below the Graph.

### Sensor Data

The bottom portion of the Sensor Summary page, the **Data** panel, contains a list of Data Reports. The reports are listed chronologically from newest to oldest. By selecting the sort button located in the header of the panel, you can sort by Reported Time and Reading in ascending or descending order.

If you have privileges to view Raw and/or Invalid data, additional filters are available to toggle the display of that data in the tabular list.

Each data report includes:

Label	Description
<b>Reported</b>	The date and time of the data report.
<b>Reading</b>	Finished data value with precision (conversion) applied.
<b>Raw</b>	Raw data reading before conversion has been applied. This column is visible only if you have Administration privileges.
<b>Quality</b>	See <b>Error! Reference source not found.</b> below. This column is visible only if you have Administration privileges.

## Retrieve Additional Data

The default display profiles all data collected by this sensor for the last 7 days. Use the date range picker to display data for different time periods.

### Note

Up to one year of data can be selected to display for Contrail Web software-as-a-service clients. It is configurable with licensed Contrail Base Station.

## Export Data

Use the data download control, located in the reports panel, to export data reports within the date range specified in the date range picker. You can choose to export the data between your selected times in two formats:

**Spreadsheet:** This downloads the data in a Microsoft Excel workbook.

**CSV:** This downloads the data in comma separated values format for importing into many models and other software programs.

## Data Quality Flags

### Data Quality Flag Validation Codes

Data Quality Flags are only visible if you have 'View Invalid data' privileges. If 'View Invalid data' privileges are not available, only 'A', 'AN', and 'AS' flagged data are visible.

The list of possible validation codes that can be assigned to a finished value are:

Validation Code	Means
<b>A</b>	good data, passed all validation tests
<b>AN</b>	good data, starting a new sequence (e.g., if a stage gauge jumped way up, we would see three reports: PD, AN, A in sequence)
<b>AS</b>	good data, received out of sequence
<b>DD</b>	duplicate data value, same raw value received within a short period of time (usually configured for 7 seconds)
<b>FT</b>	Future Time. Data was stored and was more than 1 hour in the future when collected. Visible only in Audit tables

<b>Validation Code</b>	<b>Means</b>
<b>IC</b>	failing invalid conversion test, examples are missing rating table, outside of range of rating table, or unknown conversion type
<b>MN</b>	failing min value test
<b>MM</b>	Maintenance Mode (sensor set to Out of Service)
<b>MT</b>	failing minimum time validation test
<b>MX</b>	failing max value test
<b>ND</b>	failing negative delta validation test
<b>NR</b>	failing negative rate of change validation test
<b>NT</b>	No data table to store live records. Visible only in Audit tables.
<b>PD</b>	failing positive delta validation test
<b>PR</b>	failing positive rate of change validation test
<b>RN</b>	failing raw min validation test, for ALERT, value < 0
<b>RX</b>	failing raw max validation test, for ALERT, value > 2047
<b>SN</b>	received out of sequence, failing min value test
<b>SX</b>	received out of sequence, failing max value test
<b>UK</b>	Unknown site/device

## Chapter 5: Graphs

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### Overview

From the Sensor page, access the graphing module by selecting the 'Graph' button. This page provides a larger graph canvas and enables you to selectively turn on and off sensors and visual thresholds. The number of sensors plotted is unlimited. The style of graph plotted is determined by the sensor type. If a Rain Increment type sensor is selected, a hyetograph plot is generated and an invert option as well as a bin option is displayed. The bin option also allows you to select the 'Accumulate' bin, which accumulates rain for the selected date range. All other sensor types are plotted as time series line graphs. If a Rain Increment sensor type is plotted with a second sensor type (Stage, Rain Accumulation, etc.), a multi-graph plot is generated with the time series data and a hyetograph plotted on the same canvas.

When two different sensor types are graphed together, the first sensor type added to the Queue, and all subsequent sensors of that type, are plotted on the left y-axis. The second sensor type is plotted with reference to the right y-axis. The third sensor type is plotted with reference to the left y-axis, etc.

In addition to sensor data, if you have privileges to view invalid data, a Latency toggle button is available which allows you to view a plot of data latency. Latency is the time difference between when the report was received by the software and the data report time stamp.

To add additional sensors to the plot, use the Add button (" + "). This button takes you to the Graph configuration page, where you can add or remove sensors from the graph queue.

### Visual Thresholds

Thresholds are used to provide a quick visual feedback when analyzing data in a graph. Thresholds are created in the Administration area of Contrail. If the threshold was enabled when it was added, the threshold automatically displays each time the sensor is graphed. The Thresholds toggle, located next to the sensor in the panel below the graph, allows you to temporarily enable/disable thresholds.

### Create your graphing criteria

Use the following options:

Option	Description
<b>View</b>	The View dropdown list displays authorized site groupings. Select a View from the list. When a View is selected, the list of available sites populates the Site dropdown list.
<b>Site</b>	Select a Site from the dropdown list. When a Site is selected, the list of available sensors populates the Sensor dropdown list.
<b>Sensor</b>	In the Sensor list, select the sensor to plot and then use the <b>Add</b> button to add it to the graph queue.
<b>Add Button</b>	Select the Add button for each sensor you wish to add to the graph queue.
<b>Graph</b>	The Graph section lists the selected site and sensor combinations that are in the queue waiting to be plotted.
<b>Remove Button</b>	You can remove sensors from the queue by selecting their associated remove button.
<b>Graph Button</b>	In the Graph queue, select the Graph button to activate the chart building engine with selected queue information.

## Graph Capabilities

### Page Controls

Option	Description
Reload	Forces reload or sets refresh interval.

### Date Range Picker

Option	Description
Today	Displays data from 00:00:00 to 23:59:59 of the current day.
Last 2 Days	Displays data from the last 48 hours.
Last 7 Days	Displays data from the last 7 Days.
Last 30 Days	Displays data from the last 30 Days.
This Month	Displays data from 00:00:00 on the first day of the month to 23:59:59 of the last day of the month.
Last Month	Displays data from 00:00:00 on the first day of last month to 23:59:59 of the last day of last month.
Custom Range	Select a fixed period to display archived data.

### Graph Controls

Markers	Toggles markers for data reports.
Legend	Toggles legend display on graph.
Zoom	Select and drag on the graph to zoom in on a specific time period.
Zoom Out	Displays only if you have zoomed in on the graph. Returns graph to time interval selected.
Bin Size	Rain Increment only option. Allows you to sum rainfall accumulations in different intervals, as well as graph the Accumulation (starting at 0) for the selected time range by selecting the 'Accumulate' bin.
Invert	Rain Increment only option. Allows you to display the rainfall summations as inverted.
Latency	If you have privileges to view invalid data, you can toggle between event and data latency.
Add (+)	Add or remove sensors from the graph.

### Visualization Control

All sensors included in the data set graphed are shown in the panels below the graph canvas. If more than one sensor has been selected, an **On/Off** toggle switch is available to turn on or off its associated sensor in the graph. If the sensor has visual thresholds associated with it, an additional "**Thresholds**" button is available. By selecting Thresholds, you can toggle on/off for each threshold associated with the sensor.

System Administrators determine if a threshold will be turned on or off on the graph when it is initially loaded. If more than one sensor is plotted on the graph, all thresholds are set to off when the graph is initially rendered.

## Chapter 6: Dashboards

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### Overview

The idea of Conrail Dashboards is to visually bring into focus, specific datasets that are important indicators for your operations and decision-making. System Administrators can gather related datasets (Widgets) to use on your Conrail Dashboard pages, so that all the data are available together in a single context. Conrail Dashboards enable you to view the data that matters most to you. For example, your System Administrator can create Dashboards that help you in your day-to-day decisions, or create a Dashboard “on-the-fly” during an extreme storm event to track and monitor specific sites that may be at high risk of flooding.

### Viewing Dashboards

If your System Administrator has created and published Dashboards, you will see a Dashboards menu available in the Navigation Bar. One or more Dashboards appear in a drop-down list. Each Dashboard has a unique descriptive name. To view, select a Dashboard from the list.

## Chapter 7: Bookmarks

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### Overview

With Contrail Bookmarks you can save links to important sites, sensors, graphs, or any other page in Contrail, for ease of retrieval in the future. There are no limits to how many bookmarks you can create. Unlike browser bookmarks, Contrail Bookmarks allows you to have your bookmarks available regardless of what device or browser you are using to access Contrail.

### Shared Bookmarks

System Administrators can create Shared Bookmarks that all users can view. These links appear under Bookmarks menu "Shared".

### User Bookmarks

You can create your own bookmarks that are only seen by you when you login. These links appear in the Bookmarks menu just above the "Shared" section of the menu.

### Creating Bookmarks

You can create bookmarks by going to your **User Profile** (gear icon > your profile). From the **Edit drop-down** menu, select **Bookmarks**. To create a new bookmark, select the **Add** button and enter the Name, Description, URL, and whether to open the page in the same window or a different window.

Additionally, you can create Bookmarks by selecting "+ **Add Bookmark**" from the Bookmarks menu.

### Editing Bookmarks

- **Shared Bookmarks** can be edited and deleted in Administration.
- **User Bookmarks** can be edited by going to your **User Profile**, (gear icon > your profile), and select Bookmarks from the Edit drop-down menu. From the list of Bookmarks, select the Edit button next to the bookmark you wish to modify.

## Chapter 8: Frequently Asked Questions (FAQs)

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### Questions an Engineering Firm might ask

#### **Q. How do I get data from last month's rain/flood for my engineering model?**

If flooding was caused by a stream going over the banks, you would look at the stage sensor at that location, and track levels that induced the overflow. You might also compare that to rain gauges to see the correlation.

You would examine Precipitation Accumulation and Precipitation Increment data if evaluating rainfall data for the model. Once you have located the specific sensor of interest through the Maps or Sites screens, drill down to the sensor details to view data for the last 7 days. You can expand that report to the event date/times, by modifying the 'Start Time' and 'End Time' parameters accordingly.

You can export the selected date range data by selecting the Download icon located in the upper-right of the Reports panel in the sensor details page.

### Questions the General Public might ask

#### **Q. What happened when my neighborhood flooded?**

If you were flooded by a river or stream that overflowed, you can look at the data for the stream to see how fast it was rising and what time the banks overflowed. To do this, select Maps at the main page of the program. Depending on your location, multiple maps may be available. Select the map option for your area, and in Type:, select stage. Here you will see icons depicting locations where stage monitoring equipment is in place.

If using the Static Maps, select the icon closest to where the stream banks overflowed to open the sensor details page. Here data for the last 7 days is automatically displayed. You can expand that report to the event date/times, by modifying the 'Start Time' and 'End Time' parameters accordingly.

If using the Pan & Zoom map, select the site icon closest to where the stream banks overflowed to open a popup graph with the latest 7 days. Select the arrow icon next to the stage sensor to open the sensor details page.

If your flooding event was caused by just the volume of rain, and not a river bank overflowing, we can show you the volume of water falling over a period of time. Go to Sites from the main page. Select Precipitation Increment from the Sensor Type filter. You can also filter by View. This displays all the sensors monitoring rainfall included in that View. Select the site nearest the location of interest to view details about the sensor and data for the last 7 days. You can expand that report to the event date/times, by modifying the 'Start Time' and 'End Time' parameters accordingly.

#### **Q. What is happening now so I can be assured I won't get flooded again?**

To monitor the rain event, you can view real time data as described in the previous question. Contact your local government agency to ask questions regarding flood prevention measures.

**Q. Can I create my own personal alarm/alert notification from the Contrail program based on certain parameters I choose?**

The creation of Alarm Rules and Alert Notifications is limited to individuals who are granted that access privilege by the System Administrator. You could request for the Administrator to add your email or text messaging address to certain notifications.

## Questions Anyone might ask

**Q. When seeing the actual data as recorded, how much time delay is there from the actual sensor reading to when it will show up on the website? Are delays different for different types of sensors?**

The answer is dependent on many variables, including the type of input system, type of sensor, and the time interval the System Administrator has requested each sensor report data. As an example, a Battery would typically report one or two times a day, indicating it is operational. A rain gauge would deliver data every time the bucket that holds the rain was tipped, and if there is no rain, it is typically programmed to report once or twice a day. A stage sensor would report only at the intervals set by the System Administrator, some are every 5 minutes, others every 15, and even others every hour.

**Q. What is the Received Time?**

The time when the data point is actually stored in the database.

**Q. What's the difference between the sensor and the type? Sometimes it seems to be the same name, other times they are different names.**

The Sensor is the System Administrator's common name for the sensor. The Type is OneRain's standardized name for the sensor. (Thus, depending on what the Administrator calls the sensor, the type and the sensor could be the same name).

**Q. What does it really mean when I see Finished Data Value with Precision applied?**

In the Contrail program, System Administrators are allowed options to calibrate the data, adjusting for many scenarios.

**Q. Is there any time when bad data are not displayed, or are they always displayed and coded with the data quality validation code?**

This depends on the source of the data. DIADvisor filters its data at the source, thus transmitting into Contrail; we always accept the direct data. For other sensors, equations are created to validate and flag data. If you have the View Invalid Data access privilege, all data regardless of quality will appear in reports, but not in graphs.

**Q. If the raw data are not always displayed, how do I access it?**

If you have the View Raw Data access privilege, you have an option to view raw data.

**Q. When I am viewing recent data at a site, does it automatically refresh the page when new data are transmitted?**

No. A Reload button, with Refresh options is available at all pages that display data.

**Q. When a situation creates an alarm, does it report immediately?**

No, alarms only evaluate every 5 minutes for Contrail Web. For Contrail Base Station and Contrail Server, alarms evaluate every 1 minute.

**Q. How do I manage alarms and notifications?**

This is best answered by providing examples, as seen below.

**Q. How do I send a text message to a phone?**

Alarm Rules can be created and modified if you have the proper access privileges. In the Alarm Rules section, in the Deliveries panel, the 'To' section is where you identify who the alarm message should be sent to. Delivery can be in the form of an email, or text message delivered to a cellular phone. You add and save a Contact for the cellular phone (see Contrail Administrator's Manual: Contacts and Groups for Alarm Deliveries). For Verizon customers: 10-digit phone number@vtext.com (Verizon also offers a website to test your message to ensure delivery [https://text.vzw.com/customer\\_site/jsp/messaging\\_lo.jsp](https://text.vzw.com/customer_site/jsp/messaging_lo.jsp)). For AT&T customers: 10-digit phone number @txt.att.net. Text message is limited to 160 characters.

Note: Characters typed in the From, Your Message, Reply To fields all count toward the 160-character message length. Thus, while alarm message can be longer than that for the benefit of the email recipients, ensure that the vital message is contained within the first 160 characters for text message recipients. From allows you to indicate sender of alarm trigger. Subject name of specified alarm being activated. In the Message box, type in a text message of your choice (example: rise greater than 1.0 feet in 15 minutes).

**Q. How do I escalate a message to additional persons if the first alarm is not acknowledged?**

You would first have to ensure the Auto Acknowledge option on the alarm rule is not activated. Then you could create a rule relevant to the desired time span for notification.

## Question a Governmental Agency might ask

**Q. I have an Emergency Action Plan that I would like to reference so that my staff has the latest version when entering into a significant event. Can I link it to an alarm Code?**

Yes. There are several ways to reference your action plan. One is by reminding them of it in an alarm message you would send via an e-mail or text message. You could direct them via a link (or other verbal description) to the location of the action plan. Alarm messaging is limited to those given that access privilege, and is under Rules in the Alarm console (Reporting > Alarms). A second option would be to upload the file under the Web Administration console (Files), and reference the file in the Sensor Notes section. A third option would be to create a direct link to your plan on your Contrail Home page.

**Q. We checked the calibration of our field instruments, and needed to make some adjustments. Are there adjustments that I have to make in the system to align with the adjustments I made in the field? How do I do that?**

Depending on the type of instrument being calibrated, and its data transmitter, you may need to make adjustments in the Contrail program. This option is limited to those given access privilege, by editing the Sensor's Calibration settings. Typically, DIADvisor makes its conversion corrections at the base station, and thus is received direct into the Contrail program. Other data sources may need to be converted accordingly.

## What are the different sources to collect data?

There are many sources, from your own sensors to other agencies and public sources that agree to share data. Some primary examples include:

- **ALERT** is a System made up of ALERT sites and sensors that have standard ALERT decoder output that is converted from serial to IP via network connection to Conrail.
- **ALERT2 Concentrated** is a System made up of ALERT sites and sensors that have been Concentrated via the ALERT2 Concentration protocol.
- **ALERT2** is a System made up of ALERT2 sites and sensors.
- **DIADvisor**, OneRain's legacy PC base station software, uses DvCollector software that runs on the PC to push data into Conrail over the network using the Data Exchange API.
- **CDEC (California Data Exchange Center) data** - The California Data Exchange Center (CDEC) installs, maintains, and operates an extensive hydrologic data collection network including automatic snow reporting gauges for the Cooperative Snow Surveys Program and precipitation and river stage sensors for flood forecasting. CDEC provides a centralized location to store and process real-time hydrologic information gathered by various cooperators throughout the State. CDEC then disseminates this information to the cooperators, public and private agencies, and news media. Website: [cdec.water.ca.gov](http://cdec.water.ca.gov).
- **Flash Flood Guidance** – Conrail hosted Data Agent that queries the National Weather Service Flash Flood Guidance estimates. Flash Flood Guidance estimates the average number of inches of rainfall of given durations required to produce flash flooding.
- **HADS (Hydro meteorological Automated Data System) collection of GOES data** - The Office of Hydrologic Development of the National Weather Service operates HADS. Real-time and near real-time data acquisition, data processing and data distribution are the attributes of HADS. The functional requirement of this system encompasses a cooperative effort involving a number of federal, state and local agencies. HADS exists in support of National Weather Service (NWS) activities of national scope, specifically the Flood and Flash Flood Warning programs administered by the weather service forecast offices and the operations performed at river forecast centers throughout the United States. Additionally HADS created data products bolster several other NWS program areas including fire weather support services, local and national analysis of precipitation events, hydrologic modeling and the verification of NEXRAD precipitation estimates. Website: <http://www.weather.gov/oh/hads/>.
- **IFLOWS** data feed. Data receiver at the Site.
- **METAR** data feed - METARs Downloader is a METAR / SPECI data processor that you can use to produce weather content for a web site or web cam. It can also be used as a personal weather tracking tool by persons or organizations without a web site or web cam. METARs Downloader produces Thirty Five (35) output items from the METAR data it downloads from the NWS servers. Thirty Three (33) of these outputs are available as charts, images, or text files which can be uploaded by the program to be used as web site content. Of those thirty three data items, eleven (11) are available as text output only. These are the chart data files, weather log file, raw METAR data, and raw TAF data. The software also has an extra feature for those who are in a marine environment, a built in NDBC (National DataBuoyCenter) browser where you can access data reported by C-MAN stations and buoys in the network. Website: [www.metarsdownloader.com](http://www.metarsdownloader.com).

- **NOAA Tides** data feed - The National Oceanic and Atmospheric Administration's vast collection of oceanographic and meteorological data (historical and real-time), predictions, and nowcasts and forecasts. NOAA Tides and Currents, managed by the Center for Operational Oceanographic Products and Services (CO-OPS), is the portal to the NOAA. Website: [tidesandcurrents.noaa.gov](http://tidesandcurrents.noaa.gov).
- **ORBCOMM** feed - Automata Interface. ORBCOMM is a leading global satellite data communications company focused exclusively on Machine-to-Machine communications. ORBCOMM provides low cost, reliable, two-way data communications services around the world through a global network of 29 low-earth orbit (LEO) satellites and accompanying ground infrastructure. ORBCOMM's products are installed on trucks, trailers, railcars, containers, heavy equipment, fluid tanks, utility meters, pipelines, marine vessels, oil wells and other assets. They system can send and receive short messages, between six bytes and several kilobytes, in near real-time, allowing users to access critical information readily, often from areas beyond the geographic reach of terrestrial systems. Website: [www.orbcomm.com](http://www.orbcomm.com).
- **RWIS** – Contrail hosted Data Collector that polls NTCIP Compliant Road Weather Information System on a timed interval and loads the data into Contrail.
- **Serial data** from an ALERT or ALERT2 network, or other direct RF feed, receiver and decoder.
- **SHEF .A and SHEF .E** – Contrail hosted Data Agents that loads SHEF data into Contrail.
- **StormLink™** data Feeds provide alternative reliable transmission methods that including low power satellite, cellular data, Internet Protocol and support concentration and reliable delivery of ALERT and ALERT2.
- **USGS** – Contrail hosted Data Agent that collects and loads USGS data available on NWIS Web into Contrail.

## Chapter 9: Glossary

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The following definitions reflect those used by the OneRain Incorporated in relation to Contrail; definitions used by other organizations and publications may vary.

Term	Definition
<b>Above Mean Sea Level</b>	The term Above Mean Sea Level (MSL) refers to the elevation (on the ground) or altitude (in the air) of any object, relative to the average sea level datum.
<b>Acknowledge</b>	Contrail provides an interface to track when a user presses a button acknowledging an alarm. This records the user and time when the alarm was acknowledged. Alarms must be acknowledged, either by a user or automatically, before they can become inactive. If the alarm is defined as auto-acknowledge (by a checkbox in its definition), then it will show up as an acknowledged without user action.
<b>Acknowledged</b>	An alarm that has been acknowledged, either by the Auto-Acknowledge function or by a manual acknowledge.
<b>Active Alarms</b>	This is a list of all Active Alarms - those that have not been acknowledged, cleared, or both.
<b>Alarm</b>	Current, un-cleared warning.
<b>Alarm Rule Equation</b>	An Alarm Threshold set as a logical equation that evaluates sensor values, other values, time periods, etc. to determine if an alarm should be set and/or a notification sent.
<b>Alarm Title</b>	Alarm Titles include the following: Alarm, Freezing, Heartbeat, Min Voltage, Repeater Status, Temp Too Hot, Temperature Low, Test, Test Precipitation, Test Stage, Wind High,
<b>ALERT</b>	Automated Local Evaluation in Real-Time. ALERT is radio based transmission protocol that was developed for low power, low bandwidth (300 baud), real-time transmission of hydrometeorological data.
<b>ALERT2™</b>	ALERT2 is the next generation upgrade and replacement for ALERT. The protocol has been developed through a Technical Working Group (ALERT2 TWG) through the National Hydrologic Warning Council (NHWC). It is designed to be backward compatible with ALERT, while providing a more robust, higher bandwidth (4800 baud), low power, modern upgrade. For more information, go to <a href="http://www.alert2.org">http://www.alert2.org</a>
<b>ALERT rollovers</b>	ALERT data are limited to the range of 0 to 2047. As data goes above 2047, or below 0, the values wrap, which can cause large offsets for simplistic data handling.

Term	Definition
<b>Bookmark</b>	A custom link saved into Contrail that can be used to access a page or graph in Contrail, or an external website.
<b>CDEC</b>	California Data Exchange Center. The California Data Exchange Center (CDEC) installs, maintains, and operates an extensive hydrologic data collection network including automatic snow reporting gauges for the Cooperative Snow Surveys Program and precipitation and river stage sensors for flood forecasting. CDEC provides a centralized location to store and process real-time hydrologic information gathered by various cooperators throughout the State. CDEC then disseminates this information to the cooperators, public and private agencies, and news media. Website: <a href="http://cdec.water.ca.gov">cdec.water.ca.gov</a>
<b>Cleared</b>	An alarm that has been cleared through the auto clear function.
<b>Client Manager</b>	The section in the Contrail program that allows you to add a new client or edit authorization terms of an existing Client.
<b>Clients</b>	Those persons from other organizations that you have allowed to have access rights to some/all of your sensors, for their own unique programming.
<b>Contrail Insight</b>	Reporting mechanism for data analysis and predictive maintenance. Sensor Network Performance Monitoring through pre-programmed reports to provide a sensor level snapshot of hydrometeorologic activity over your predetermined period of interest. Lets you see easily which sites are consistently having problems, and which ones are doing well.
<b>Coordinated Universal Time</b>	Coordinated Universal Time (UTC) is a high-precision atomic time standard. UTC has uniform seconds defined by International Atomic Time (TAI) with leap seconds announced at irregular intervals to compensate for the Earth's slowing rotation and other discrepancies. Leap seconds allow UTC to closely track Universal Time (UT), a time standard based not on the uniform passage of seconds, but on the Earth's angular rotation. Time zones around the world are expressed as positive or negative offsets from UTC. Local time is UTC plus the time zone offset for that location, plus an offset (typically +1) for daylight saving time, if in effect. UTC replaced Greenwich Mean Time on January 1, 1972 as the basis for the main reference time scale or civil in various regions. UTC is also referred to by the military and civil aviation as Zulu time (Z).
<b>Data Quality Flag</b>	Data quality code assigned to data based upon automated data validation procedures applied to all incoming data. See data quality flags in the table of contents to see the possible values and their meanings.

Term	Definition
<b>Data Agent</b>	Package to actively collect information from publicly available web resources. The Data-Agent is designed to scrape information from a web resource and generate a normalized data file.
<b>Data Exchange</b>	The Data-Exchange API is an HTTP XML interface to Contrail. It can be used to both submit to and retrieve from the database.
<b>DIADvisor™</b>	OneRain’s DIADvisor is a real-time Microsoft Windows application that collects, stores, and displays environmental data. The displays include the latest sensor values and area averaged rainfall.
<b>Dynamic SQL</b>	Dynamic SQL is an enhanced form of Structured Query Language (SQL) that, unlike standard (or static) SQL, facilitates the automatic generation and execution of program statements. This can be helpful when it is necessary to write code that can adjust to varying databases, conditions, or servers. It also makes it easier to automate tasks that are repeated many times.
<b>Finished</b>	This value is the same as the reading value; the value after data conversion is applied.
<b>HADS</b>	Hydrometeorological Automated Data System. This is a collection of GOES data - The Office of Hydrologic Development of the National Weather Service operates HADS. Real-time and near real-time data acquisition, data processing and data distribution are the attributes of HADS. The functional requirement of this system encompasses a cooperative effort involving a number of federal, state and local agencies. HADS exists in support of National Weather Service (NWS) activities of national scope, specifically the Flood and Flash Flood Warning programs administered by the weather service forecast offices and the operations performed at river forecast centers throughout the United States. Additionally HADS created data products bolster several other NWS program areas including fire weather support services, local and national analysis of precipitation events, hydrologic modeling and the verification of NEXRAD precipitation estimates. Website: <a href="http://www.weather.gov/oh/hads">http://www.weather.gov/oh/hads</a>
<b>Hold Off Clear Time</b>	Hold Off equations are created to reduce alarm triggers for data that meets an alarm condition, but is a unique situation not resulting in an actual alarm situation. An example would be wind causing a wave effect in a stream, resulting in a higher water level due to a wave effect, and not the actual depth of the stream water at that given time.

Term	Definition
<b>icon(s)</b>	An icon is a graphic selected by the System Administrator to help visualize a point on a map, The icon may have a significant value, such as a plane icon identifying a site located at or near an airport. The icons represent sites and sensors, and will change color depending on the condition of the sensor; a red icon would indicate an alarm condition, a green icon would indicate a sensor in active operation status. An icon legend is included in this program, which can further explain the definition of the various icon graphics and colors.
<b>IFLOWS</b>	The Federal Integrated Flood Observing and Warning System (IFLOWS), created in the late 1970's to assist flood-prone communities, is a cost-sharing cooperative venture between the National Weather Service (NWS) and seven flood-prone Appalachian states (KY, NC, NY, PA, TN, VA, and WV). IFLOWS uses communications technology and software to collect real time sensor data from remote locations, and disseminate the data among government organizations responsible for public safety. Website: <a href="http://www.afws.net">http://www.afws.net</a>
<b>Input System</b>	System defined to load data into Contrail.
<b>Last Reported</b>	Last Reported - Last valid good record. Users with privileges to see invalid data can see the records.
<b>METAR</b>	METAR is the international standard code format for hourly surface weather observations which is analogous to the SA coding currently used in the US. The acronym roughly translates from French as Aviation Routine Weather Report. METAR means aviation routine weather report and is predominantly used by pilots in fulfillment of a part of a pre-flight weather briefing, and by meteorologists, who use aggregated METAR information to assist in weather forecasting. The majority of METAR stations are located at Airports. Contrail collects METAR data actively using its Data-Agent package. Contrail decodes a METAR report and stores temperature, wind velocity, wind direction, and incremental precipitation. When configuring a METAR site use the four-character ICAO Location as the Site Id and the Sensor Id's (Temp, Vel, Dir, Rain). List of available stations.
<b>NOAA Tides</b>	NOAA Tides data feed - The National Oceanic and Atmospheric Administration's vast collection of oceanographic and meteorological data (historical and real-time), predictions, and nowcasts and forecasts. NOAA Tides and Currents, managed by the Center for Operational Oceanographic Products and Services (CO-OPS), is the portal to the NOAA. Website: <a href="http://tidesandcurrents.noaa.gov">tidesandcurrents.noaa.gov</a>

Term	Definition
<b>NWS</b>	National Weather Service - Official US weather, marine, fire and aviation forecasts, warnings, meteorological products, climate forecasts and information about meteorology.
<b>Operational</b>	Fully operational, no known problems.
<b>ORBCOMM</b>	ORBCOMM is a leading global satellite data communications company focused exclusively on Machine-to-Machine communications. ORBCOMM provides low cost, reliable, two-way data communications services around the world through a global network of 29 low-earth orbit (LEO) satellites and accompanying ground infrastructure. ORBCOMM products are installed on trucks, trailers, railcars, containers, heavy equipment, fluid tanks, utility meters, pipelines, marine vessels, oil wells and other assets. They system can send and receive short messages, between six bytes and several kilobytes, in near real-time, allowing users to access critical information readily, often from areas beyond the geographic reach of terrestrial systems. Website: <a href="http://www.orbcomm.com">www.orbcomm.com</a>
<b>Out of Service</b>	Currently disabled and not available (either under maintenance, or no longer being used).
<b>Predicted Rainfall</b>	Measurement of predicted rainfall based on StormData™ Gauge-Adjusted Radar Rainfall data.
<b>Predicted Rainfall Accumulation</b>	Measurement of predicted rainfall accumulation based on StormData™ Gauge-Adjusted Radar Rainfall data.
<b>Quality</b>	Here the term is used in relation to the value of the data collected.
<b>Quality Validation Codes</b>	A one or two-character alpha code assigned to processed data (finished value) that indicates the status and quality of the data. See <b>Error! Reference source not found.</b> on page <b>Error! Bookmark not defined..</b>
<b>Raw</b>	This is the value supplied by the source system. It is the value before any conversion or validations are applied.
<b>Reading</b>	Finished data value with precision (conversion) applied.
<b>Real Time Data Service</b>	Real Time Data Service. OneRain uses real-time radar data from its vendors and real-time rain gauge data from its customers to calibrate the radar data and deliver rainfall data immediately back to the customer in a variety of formats for decision support.
<b>Reported</b>	The date and time of the last data report received by the sensor.

Term	Definition
<b>RWIS</b>	Road Weather Information System. A network of meteorological and pavement sensors located along the highway system.
<b>Sensor</b>	A sensor is a device used to monitor a specific condition. There are numerous types of sensors, all designed to monitor different things. A stage sensor monitors the depth of water, a rain gauge monitors rainfall, a battery sensor would identify if a battery is functional or has lost its power (discharged).
<b>Site ID</b>	A unique name/number assigned to a site by the owner of the site.
<b>Sites</b>	A Site is a specific location in your data set (and in the real world) where one or more sensors are located. The site is described by elevation, longitude and latitude. The System Administrator may have provided an additional note at the Site Details page to provide a more detailed description of the location.
<b>Source Data Parameters</b>	These are the various ways to collect information. See each topic separately for more detailed description of each source.
<b>Sparkline</b>	A small line chart typically drawn without axes or coordinates. Although a free floating line, you can quickly view any significant changes to assess the overall movement/change of the data being monitored. These little data lines, because of their active quality over time, are called sparklines: small high-resolution graphics embedded in a context of words, numbers, and images. Sparklines are data-intense, design-simple, word-sized graphics. Contrail Insight supports sparkline charts and is designed to give a visual snapshot of your overall sensor network health.
<b>SQL</b>	Structured Query Language: Dynamic SQL is an enhanced form of Structured Query Language (SQL) that, unlike standard (or static) SQL, facilitates the automatic generation and execution of program statements. This can be helpful when it is necessary to write code that can adjust to varying databases, conditions, or servers. It also makes it easier to automate tasks that are repeated many times.

**Term****Definition****StormData™ Gauge Adjusted Radar Rainfall (GARR)**

StormData™ Gauge Adjusted Radar Rainfall (GARR) is a OneRain product that marries rain gauge estimates at a point with the spatial distribution information from the National Weather Service NEXRAD radars to give us information about what is happening between the gauges. The rain gauge data are used to calibrate the radar and generate rainfall estimates for each 1-km or 2-km pixel, depending upon the resolution of the data that is used. GARR data are used in flood warning, runoff modeling, I/I studies, litigation, real time control, design storms and National Pollutant Discharge Elimination System (NPDES) compliance activities. Accurate rainfall estimation is an important issue in research and engineering fields. The traditional approach is to use a number of rain gauges to create the spatial and temporal rainfall distribution using different interpolation algorithms. Using this technique, rainfall estimates are marred by the sparse distribution of rain gauge network and events that occur between gauges are not captured by the gauges. Radar rainfall estimates, on the other hand, can capture the entire rainfall events but physical characteristics of radar system and operational practices have determined that radar rainfall estimates are not always consistent with ground truth. Gauge adjusted radar rainfall estimates combine the advantages of both radar and gauges, resulting in better rainfall estimate.

**Synthetic Sensor**

A synthetic sensor derives its value from data collected at another (real) sensor. Synthetic sensors can be a direct conversion, or derived from equations or rating tables. Once this sensor has been created, the next step is to edit the sensor source to bind it to a real sensor. As an example, the rain accumulation sensor is synthetic - getting its value from the accumulation of the rain increment sensor.

**System Interfaces**

There are two types of system interfaces, Input and Output.

**System Type**

System Types are pre-defined in Conrail and have a default System Interface of Input or Output. Systems types are already configured with specific settings, an interface, and addressing (for data-flow). Systems Types can have System Attributes, that are used to manage how a system is configured and use.

**Target**

Target - Synonymous with destination, a target is a file, device or any type of location to which data are moved or copied. Many computer commands involve copying data from one place to another. One says that the computer copies from the source to the target (or destination).

**Threshold**

A measurement helpful to readily understand data relevancy in relation to environmental situations.

Term	Definition
<b>Triggered</b>	A sensor that has reached a pre-determined "value" such that it triggers an alarm.
<b>Type</b>	The type of sensor, which is defined by a pre-assigned sensor class.
<b>URL</b>	URL (Uniform Resource Locators) are the standardized means of addressing pages in the Web. There are two basic types of URLs: absolute and relative. They each have their place for use in links in your websites. Absolute URLs specify the location of a Web page in full, and work identically no matter where in the world you are. Relative URLs are context-sensitive, giving a path with respect to your current location.
<b>User(s)</b>	Person(s) who has been authorized to view the Contrail program, as well as any additional access privileges granted to them.
<b>USGS</b>	United States Geological Survey is a scientific agency of the United States government. The USGS provides impartial information on the health of our ecosystems and environment, the natural hazards that threaten us, the natural resources we rely on, the impacts of climate and land-use change, and the core science systems that help us provide timely, relevant, and useable information.
<b>UTC</b>	Universal Time Coordinated (UTC) is a high-precision atomic primary time standard by which the world regulates clocks and time. UTC has uniform seconds defined by International Atomic Time (TAI) with leap seconds announced at irregular intervals to compensate for the Earth's slowing rotation and other discrepancies. Leap seconds allow UTC to closely track Universal Time (UT), a time standard based not on the uniform passage of seconds, but on the Earth's angular rotation. Time zones around the world are expressed as positive or negative offsets from UTC. Local time is UTC plus the time zone offset for that location, plus an offset (typically +1) for daylight saving time, if in effect. UTC replaced Greenwich Mean Time on January 1, 1972 as the basis for the main reference time scale or civil in various regions. UTC is also referred to by the military and civil aviation as Zulu time (Z).
<b>View(s)</b>	View(s) are used to group sites together for viewing on maps or lists.

## Chapter 10: Technical Support

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For support and questions about your system, contact the System Administrator shown at the bottom of the Home page.

For more information about OneRain products and services, or for technical assistance:

OneRain Incorporated  
1531 Skyway Drive, Unit D  
Longmont, Colorado 80504  
USA

Email: [contrail.support@onerain.com](mailto:contrail.support@onerain.com)

Web Site: [www.onerain.com](http://www.onerain.com)  
Phone Toll Free: +800-758-RAIN (7246) or Local: +303-774-2033  
(USA – MT 8:00 a.m. to 5:00 p.m., Mon.-Fri.)