Quality Assurance (QA) on CHaMPMonitoring.org

I. Introduction to Quality Assurance

For 2013, the end-of-season quality assurance review will build upon the quality assurance already completed during the end-of-day validation on the data logger, the post-process qa review in the GIS CHaMP Toolbar, and end-of-hitch validation performed while publishing data in the Data Broker (see Section 9 of the CHaMP field protocol). The goal of using electronic data loggers and the data upload functionality was to ensure a level of quality control during the data collection phase. Ensuring quality control early in the data collection process will help minimize the amount of quality assurance that must be done at the end of the season. Together these precautions should result in data that is much cleaner upon initial post-season quality assurance inspection. As a result, the focus of end-of-season quality assurance will be on visually reviewing the derived metrics for anomalous or spurious values. This review can be performed by sorting and filtering metric values in a table or by review charts of each metric.

This document provides guidance on performing end-of-season quality assurance using the functionality on CHaMPMonitoring.org. The quality assurance process will be most efficient if you first ensure that auxiliary and topographic data for all of your sites has been uploaded to CM.org using the Data Broker. *An overview of the steps is provided here with detailed description in the following sections.*

Step 1: Report In-season Site Rejections and Clean Hitches

a. From the "Data Check In" tab, use the pencil icon to update site evaluation information for any sites that were rejected during the field data collection.
    a. Review all sites with AuxFileStatus=DataCollectionDownloaded, Data Collection Field Collection and New Planned.
b. From the "Data Check In" tab, use the red minus icon to remove sites from hitches that were not sampled during the given hitch.

Step 2: Data Upload

a. From the "Data Check In" tab, review the visits where Visit Phase = Data Collection. These visits do not have a complete data upload. Review the Auxillary Data Files, Site Photos, Topographic Data, Air Temp Readings, Stream Temp Readings, and Solar Input columns to identify the missing data set(s).
b. Use the Data Broker to complete data upload for all visits in the watershed.
c. If there are data upload problems, create a spreadsheet to track the issues and contact Steve Rentmeester to help resolve those issues.

Step 3: Tag Visits with Purpose

a. From the Visit tab on the Watershed Detail Page, review the set of columns that describe the purpose of this visit (CHaMP Core, CHaMP 10% Revisit, CHaMP-PiBO Comparison, IMW, Effectiveness, Has Fish Data, Velocity Validation, and Bug Validation). A "Yes" should appear in each column that applies for the visit. Each visit can have multiple purposes.
b. If the tags are not set correctly, edit the purpose of visits. In the column "Edit Purpose of Visit", click the tag icon. Use the popup dialog to check on or off the different purposes of the visit. The following tags are applicable to the visits conducted in 2014: CHaMP Core, IMW, Has Fish Data, and AEM
c. Review and update all visits completed by your organization.

Step 4: Targeted Review of Measurements

a. A limited set of quality assurance calculations are performed by CM.org and are displayed in the auxiliary data grids on the Measurements tab (e.g. Station Discharge, or Sum LWD Count or Sum Of Fish Cover). Reviewing these calculated values provides an efficient means to identify outliers in the underlying measurement data.

Step 5: Review Metrics at Watershed-scale

a. From the Metric tab, use the Protocol drop down to filter the rows and columns in the metric grid.
b. Review the graph of each derived metric for outliers
c. Review graphs suggested in detailed section of Step 4 that target both outliers and functional relationships expected within the data.
d. If an outlier is identified in steps a or b, sort or filter the grid for that metric
e. Hold the "Ctrl" key and click the SiteId hyperlink for the that visit
f. In the new browser tab, review the measurements that participate in the derived metric value
g. Update any spurious measurements that may be contributing to the derived metric outlier. If measurement data is correct, make no changes
h. Refresh the metric grid (Metrics calculations are updated when changes are detected to the underlying measurements. Re-calculation may take 24 hours for RBT metrics)
i. Repeat for all visits where the metric has an extreme or spurious value
j. Repeat this process metric-by-metric until all metrics have been reviewed

k. **Set QA Status for:**
Visit Information
Topographic Data
Discharge
Channel Unit

Step 6: Review Metadata about Control Network

a. Review metadata information for monuments, benchmarks, control points andmarkers, and temperature loggers
b. Review and update UTM coordinates as needed
c. **Set QA Status for:**
Benchmarks
Control Point
Monument
Site Marker

Step 7: Review Temperature Logger metadata and data

a. Refer to the Stream Temperature QA Protocol
b. **Ensure thee QA Status has been set for the following tables.**
Air Temperature Logger
Stream Temperature Logger
Stream Temperature Logger Maintenance

Step 8: Additional Review of Measurements (Optional)

a. From the Measurement tab, review all grids
b. For each grid, review all available graphs
c. For each column, sort the column, review outliers and fill in nulls
d. Review RBT images for each Site, with highest priority to repeat sites, complex sites or difficult sites to survey.
e. Set QA Status for:
Transect Photos
Cross-Section
Riparian Structure
Solar Pathfinder
Large Woody Debris
Woody Debris Jam
Jam Has Channel Unit
Pool Tail Fines
Pebble Cross Section
Pebble
Undercut Banks

Step 9: Promote Data for Each Visit

a. From the Metric tab on the Site Details page, click “Promote Data”
b. From the Visit tab on the Watershed page, track progress using Visit Phase column
c. Promote all visits within the watershed.
d. Document any NON-promoted visits in the QA status of the Visit table.

This completes the Watershed Manager Review of Measurement and Metric Data.The following steps are Program Level QA review and release of data.

Step 10: CHaMP Program QA Lead review of metric data

a. After crew supervisors and watershed managers have completed the watershed-level quality assurance process, the Program QA Lead will begin reviewing the metric data using a variety of uni-variate and bi-variate plots. The Program QA Lead will follow up with crew supervisors and watershed managers on an as needed basis to resolve remaining data quality issues.

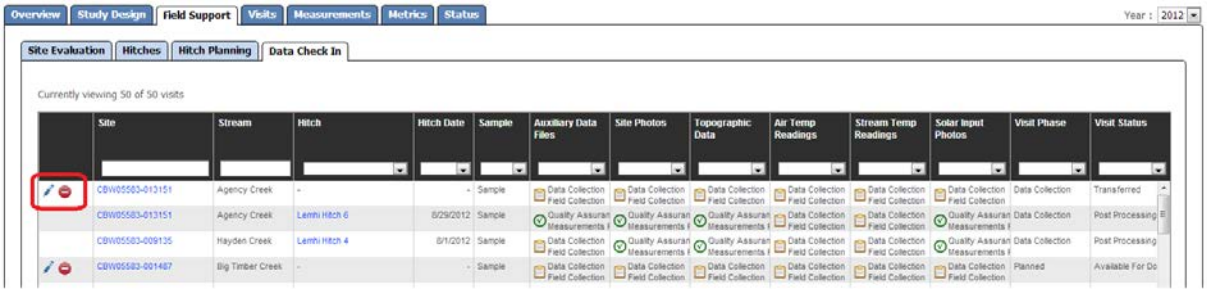
Step 11: Release of CHaMP data to public

a. After data has been reviewed by Watershed Managers and the CHaMP Program QA Lead, promoted metric data will be released to the public.

II. Detailed Guide to QA Steps

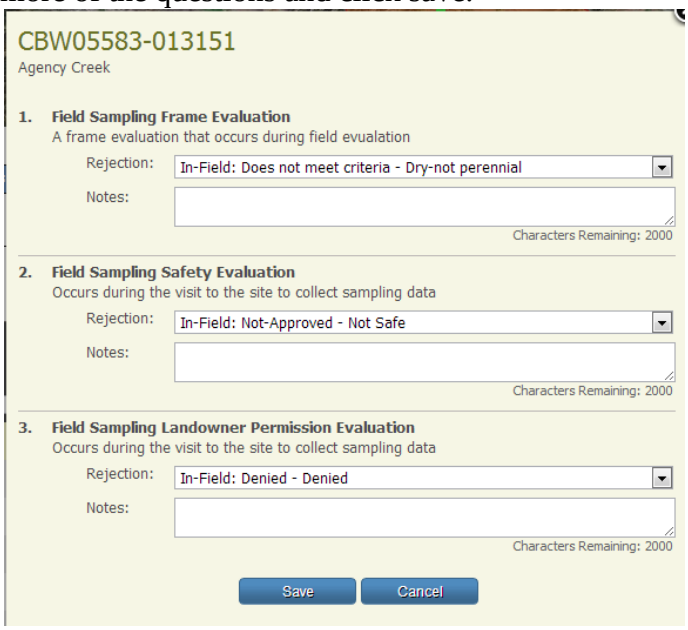
Step 1: Report In-season Site Rejections and Clean Hitches

The goal of this step is to report in-season site rejections and to remove any visits that were downloaded to a hitch but not sampled. This work will be completed in the "Data Check In" tab on the "Field Support" tab.



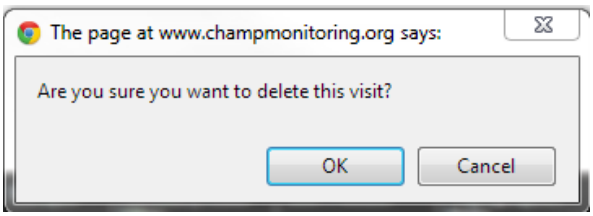
a. Report In-season Site Rejections

For sites that were rejected by the scout or field crew, click the pencil icon in the first column of the grid. This will open the site evaluation form. Answer one or more of the questions and click save.



b. Clean Hitches

For any sites that were added to a visit and then subsequently not needed for that hitch, it is necessary to remove that site from the hitch. For that visit, click the red minus icon in the grid. You will be asked to confirm deleting the visit. Click yes.



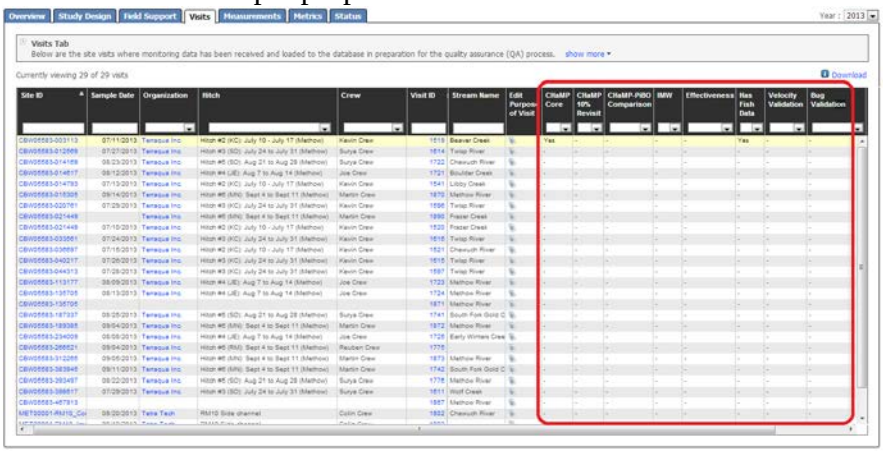
Step 2: Complete Data Upload

a. Use the Data Broker to complete data upload for all visits in the watershed--this includes temperature data, topographic data, photos, and files from the data logger.
b. If there are data upload problems, create a spreadsheet to track the issues and contact Steve Rentmeester to help resolve those issues.

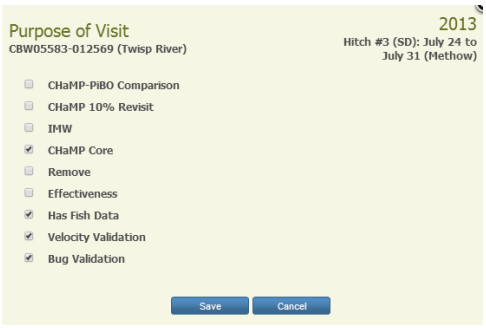
Step 3. Tag Visits with Purpose

Tags are used to help track which visits were completed and why the visit was completed. This helps program leads to ensure that multiple objectives are meet, helps data analysts find the set of visits that participate in various analyses, and supports flexibility for project collaborators. Watershed Managers and Crew Supervisor have the most direct know of what visits are completed during a field season, the purpose for those visits, and sites where overlapping monitoring occurs (e.g. sites where fish are monitored). Watershed Managers and Crew Supervisor should review and update the purpose of all visits completed in their watershed or by their organization.

a. From the Visit tab on the Watershed Detail Page, review the set of columns that describe the purpose of this visit (CHaMP Core, CHaMP 10% Revisit, CHaMP-PiBO Comparison, IMW, Effectiveness, Has Fish Data, Velocity Validation, and Bug Validation). A “Yes” should appear in each column that applies for the visit. Each visit can have multiple purposes.



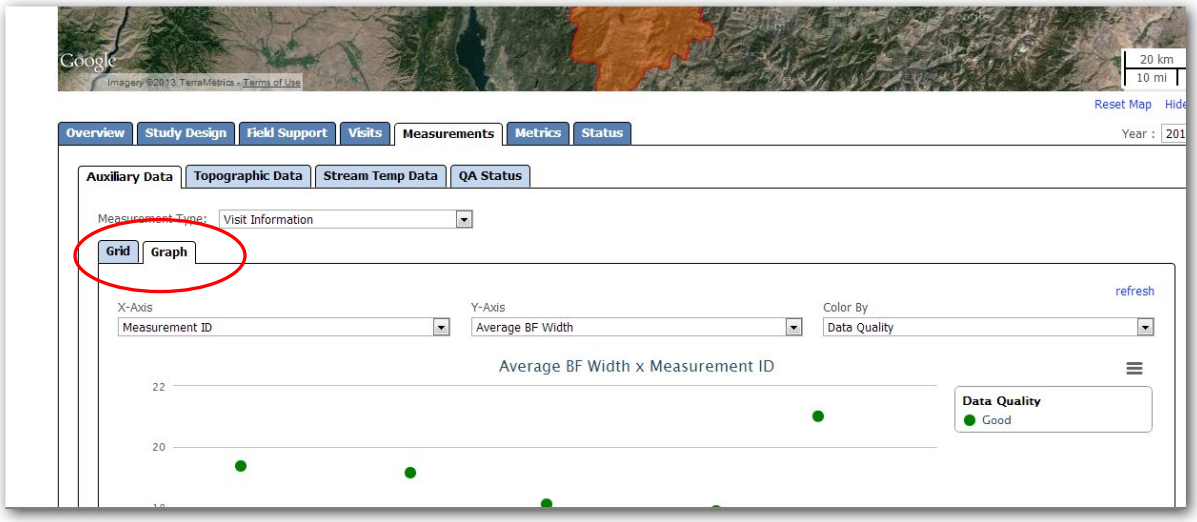
b. If the tags are not set correctly, edit the purpose of visits. In the column “Edit Purpose of Visit”, click the tag icon. Use the popup dialog to check on or off the different purposes of the visit. The following tags are applicable to the visits conducted in 2014: CHaMP Core, IMW, Has Fish Data, and AEM



Review and update all visits completed by your organization.

Step 4: Targeted Review of Measurements (Watershed Detail page)

There are two ways to review Measurement data on the Watershed Detail page: by GRID or GRAPH. Begin QA using the GRAPH tab, and switch to the GRID tab as needed to update data.



a.Review the following Measurement Type graphs for outliers and repair data.

Measurement Type	X	Y	Color By	Notes
Bankfull Width	Site Length	Average BF Width	Data Quality	
Visit	Site Length	Count of LWD	Data Quality	Available after 10/23
Site Marker	Elevation	Elevation	Data Quality	Review Nulls
Monument	Elevation	Elevation	Data Quality	Review Nulls
Benchmark	Elevation	Elevation	Data Quality	Review Nulls
Control Point	Elevation	Elevation	Data Quality	
Cross Section	Average Bankfull Width	Total Discharge	Data Quality Bankfull Width Category	
Discharge	Depth	Velocity	Data Quality	
Discharge	Depth	Discharge	Data Quality	
Channel Segment	Average Bankfull Width	Side Channel Length	Data Quality Bankfull Width Category	
Fish Cover	Average Bankfull Width	Total No Fish Cover	Data Quality Width Category	
Pebbles	Measurement ID	Cobble Percent Buried	Data Quality Strahler Order	
Pebbles	Measurement ID	Cobble Percent Fines	Data Quality Strahler Order	
Undercut Banks	Average Bankfull Width	Estimated Undercut Area	Data Quality Strahler Order	
Undercut Banks	Average Bankfull Width	Average Width	Data Quality Strahler Order	

b. Investigative Review of Measurement Types. After reviewing the recommended graphs listed in the table above, we recommend 10-15 minutes of free-form, investigative review of the Measurement data. The graphing interface allows efficient review of measurements, and this is an opportunity to review measurements crews may have had trouble with or are particularly interesting in your watershed. We suggest keeping this to a finite amount of time to avoid the 'rabbit hole' exploration of data.

c. Measurement Types to Skip. The following Measurement Types (aka tables) are low priority to review on champmonitoring.org. These measurement data are either QAed on the data logger or are better reviewed as metrics:

- Riparian Structure
- Transect Photos
- Drift Invertebrate
- Pool Tail Fines
- Pebble Cross Section
- *Drift Invertebrate Sample Results--not available until early 2015*
- *Taxon by Size Class Counts (not available until early 2015)*

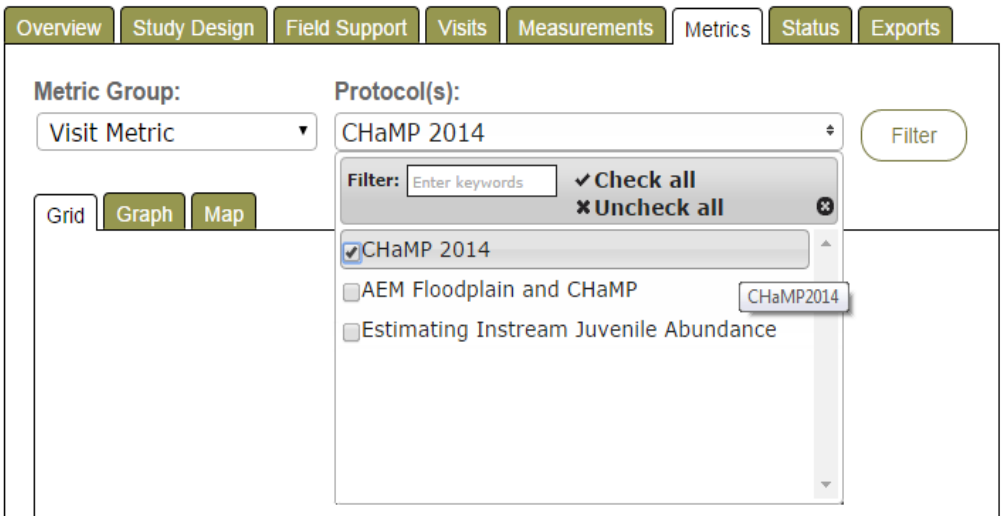
- *Sample Biomasses (not available until early 2015)*

d. Measurement Types to Review using the Stream Temperature QA Protocol. The following tables are reviewed as part of the stream and air temperature data cleaning process and are covered in STEP 6, so don't panic.

- Stream Temperature Logger
- Air Temperature Logger
- Stream Temperature Logger Maintenance

Step 5: Review Metrics at Watershed-scale

a. From the Metric tab, use the Protocol drop down to filter the rows and columns in the metric grid.



b. Review the graph of each derived metric by selecting each metric listed in the Y-axis drop down. This will produce an index-plot or y-scatter plot of the metric. Points will be color code as green, yellow, or red based on thresholds established by the CHaMP Program QA Lead.
    i. The x-axis can also be set using the drop down. This will produce an x-y scatter plot. It is recommended to use the index-plot unless there is a known relationship between two metrics that is informative for qa-ing the metrics.
    ii. The color of points can also be set using the drop down. This will color points based on a site covariate. Again it is recommended to use "Data Quality" for color coding, unless there is a known relationship between two metrics.

c. Review the graphs listed below to identify outliers or anomalies in metrics. **Please review all graphs listed in BLACK. If the process is going smoothly, review the BLUE graphs as well. The list of graphs will review all metrics within the CHaMP program.** If you feel a different X axis value will be better for QA purposes of the listed Y axis data, please feel free to graph the new x-y combination as well:

#	Metric Group	X axis	Y axis	Color Code	Area to check if suspect
1	Visit	Metric ID	Detrended Elevation SD	Data Quality	TIN/Topo DEM or Detrended DEM
2	Visit	Metric ID	Wetted Depth SD	Data Quality	Edge of Water Points, Water Surface TIN/DEM
3	Visit	Site Length	Wetted Width Integrated	Data Quality	Wetted polygon, Wetted centerline
4	Visit	Site Length	Site Length Wetted	Data Quality	Wetted centerline
5	Visit	Site Length	Wetted WidthToDepth Ratio Avg	Data Quality	Thalweg, wetted polygon, wetted cross sections
6	Visit	Wetted Site Length	Bankfull Site Length	Data Quality	Bankfull centerline
7	Visit	Wetted Site Length	Thalweg Site Length	Data Quality	Thalweg
8	Visit	Bankfull Width Avg	Bankfull Width Integrated	Data Quality	Bankfull polygon, bankfull centerline
9	Visit	Bankfull Width Avg	Bankfull WidthToDepth Ratio Avg	Data Quality	Thalweg, bankfull polygon, bankfull cross sections
10	Visit	Bankfull Width Avg	Discharge	Data Quality	Discharge measurement table
11	Visit	Bankfull Width Avg	Substrate <2mm	Data Quality	Pebble table
12	Visit	Bankfull Width Avg	Substrate <6mm	Data Quality	Pebble table
13	Visit	Bankfull Width Avg	Substrate Est: Boulders	Data Quality	Substrate Cover table
14	Visit	Bankfull Width Avg	Substrate Est: Cobbles	Data Quality	Substrate Cover table
15	Visit	Bankfull Width Avg	Substrate Est: Coarse and Fine Gravel	Data Quality	Substrate Cover table
16	Visit	Bankfull Width Avg	Substrate Est: Sand and Fines	Data Quality	Substrate Cover table
17	Visit	Bankfull Width Avg	Conductivity	Data Quality	Water chemistry table
18	Visit	Bankfull Width Avg	Alkalinity	Data Quality	Water chemistry table
19	Visit	Bankfull Width Integrated	Bankfull Width Avg	Data Quality	Bankfull cross sections
20	Visit	Bankfull Width Integrated	Large Wood Frequency: Bankfull	Data Quality	Large Woody Piece table
21	Visit	Bankfull Width Integrated	Large Wood Volume:Bankfull	Data Quality	Large Woody Piece table
22	Visit	Wetted Width Integrated	Bankfull Width Integrated	Data Quality	Bankfull polygon, bankfull centerline
23	Visit	Wetted Width Integrated	Wetted Width Avg	Data Quality	Wetted cross sections
#	Metric Group	X axis	Y axis	Color Code	Area to check if suspect
24	Visit	Wetted Width Integrated	Large Wood Frequency:	Data	Large Woody Piece

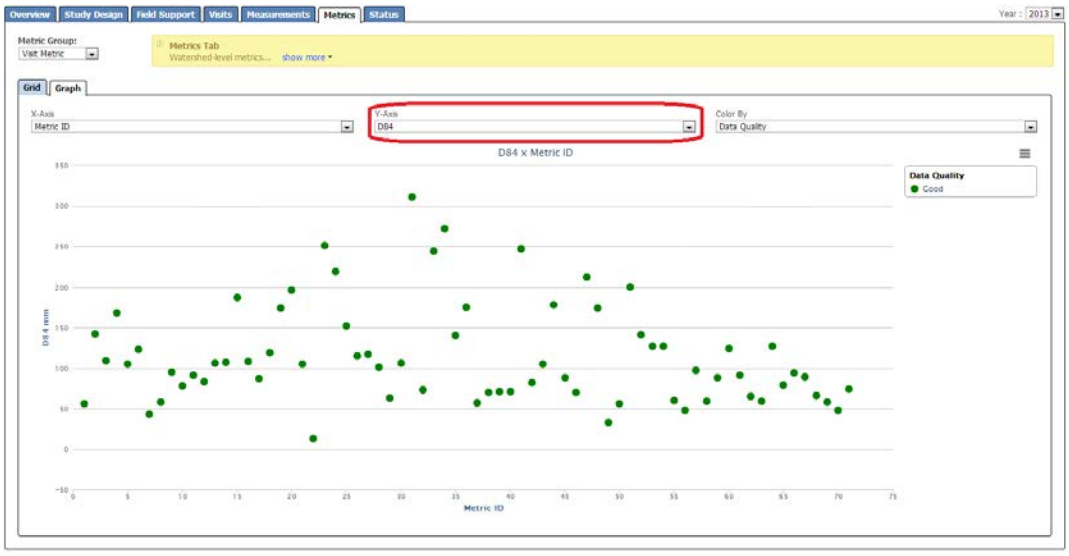
			Wetted	Quality	table
25	Visit	Wetted Width Integrated	Large Wood Volume: Wetted	Data Quality	Large Woody Piece table
26	Visit	Gradient	Sinuosity	Data Quality	Thalweg
27	Visit	Wetted Area	Bankfull Area	Data Quality	Bankfull polygon
28	Visit	Wetted Area	Fish Cover: Total	Data Quality	Fish Cover table
29	Visit	Wetted Area	Percent Undercut By Area	Data Quality	Undercut table
30	Visit	Wetted Area	Percent Undercut By Volume	Data Quality	Undercut table
31	Visit	Wetted Area	Fish Cover: None	Data Quality	Fish Cover table
32	Visit	Wetted Volume	Bankfull Volume	Data Quality	Bankfull polygon, DEM
33	Visit	Elevation (or Average Bankfull Width)	Riparian Cover: Big Tree	Data Quality Nat Class	Riparian structure table
34	Visit	Elevation (or Bankfull Width Avg)	Riparian Cover: Woody	Data Quality Nat Class	Riparian structure table
35	Visit	Elevation (or Bankfull Width Avg)	Riparian Cover: No Canopy	Data Quality Nat Class	Riparian structure table
36	Visit	Elevation (or Bankfull Width Avg)	Riparian Cover: Coniferous	Data Quality Nat Class	Riparian structure table
37	Visit	Riparian Cover: Big Tree	Riparian Cover: No Canopy	Data Quality	Riparian structure table
38	Visit	Elevation (or Bankfull Width Avg)	Riparian Cover: Non-Woody	Data Quality Nat Class	Riparian structure table
39	Visit	Elevation (or Bankfull Width Avg)	Riparian Cover: Understory	Data Quality Nat Class	Riparian structure table
40	Visit	Riparian Cover: No Canopy	Solar Access: Summer Avg	Data Quality	Solar Access table
41	Visit	Substrate <2mm	Substrate <6mm	Data Quality	Pool tail fines table
42	Visit	Substrate <2mm	Substrate: Embeddedness Avg	Data Quality	Pool tail fines table, pebble table
43	Visit	D50	D84	Data Quality	Pebble table
44	Visit	D16	Substrate <6mm	Data Quality	Pebble table, pool tail fines table
45	Visit	D50	Substrate: Boulders and Cobbles	Data Quality	Pebble table,
46	Visit	Slow Water Area	Slow Water Volume	Data Quality	Channel Unit table and feature class
47	Visit	Slow Water Area	Residual Pool Depth	Data Quality	Channel Unit table and feature class
#	**Metric Group**	**X axis**	**Y axis**	**Color Code**	**Area to check if suspect**

48	Visit	Fast Turbulent Area	Fast Turbulent Volume	Data Quality	Channel Unit table and feature class
49	Visit	Fast NonTurbulent Area	Fast NonTurbulent Volume	Data Quality	Channel Unit table and feature class
50	Visit	Slow Water Count	Pool Frequency	Data Quality	Channel Unit table and feature class
51	Visit	Fast Turbulent Count	Fast Turbulent Frequency	Data Quality	Channel Unit table and feature class
52	Visit	Fast NonTurbulent Count	Fast NonTurbulent Frequency	Data Quality	Channel Unit table and feature class
53	Visit	Discharge	Drift Biomass	Data Quality	Drift Invertebrate sample table
54	Visit	Wetted Channel Braidedness	Bankfull Channel Braidedness	Data Quality	Bankfull Islands, bankfull centerline Wetted Islands Wetted centerline
55	Visit	Wetted Channel Braidedness	Side Channel Percent By Area	Data Quality	Channel units Wetted islands Wetted centerline Wetted Polygon
56	Visit	Wetted Channel Island Count	Bankfull Channel Island Count	Data Quality	Bankfull Islands, bankfull centerline Bankfull polygon Wetted Islands Wetted centerline Wetted polygon
57	Visit	Bankfull Width Avg	Bankfull Side Channel Width	Data Quality	Bankfull Islands, bankfull centerline Bankfull Cross sections
58	Visit	Wetted Site Length	Bankfull Side Channel Length	Data Quality	Bankfull Islands, wetted centerline Bankfull centerline
59	Visit	Wetted Site Length	Wetted Side Channel Length	Data Quality	Wetted islands, wetted centerline
60	Visit	Bankfull Width Avg	Wetted Area	Data Quality	Wetted polygon
61	Visit	Bankfull Width Avg	Thalweg Depth Avg	Data Quality	Thalweg, DEM,WSEDEM
62	Visit	Bankfull Width Avg	Wetted Channel Side Channel Width	Data Quality	Wetted islands, wetted cross sections
63	Stream Temperature	Elevation	Weekly Maximum Temperature: Days>12	Data Quality	
64	Stream Temperature	Elevation	Weekly Maximum Temperature: Days>13	Data Quality	
65	Stream Temperature	Elevation	Weekly Maximum Temperature: Days>16	Data Quality	
66	Stream Temperature	Elevation	Weekly Maximum Temperature: Days>18	Data Quality	
67	Stream Temperature	Elevation	Weekly Maximum Temperature: Days>20	Data Quality	
68	Stream Temperature	Elevation	Weekly Maximum Temperature: Days>22	Data Quality	

In addition to Metric Review at the VISIT level, we suggest additional review of Tier 2 Summaries. Review of GCD (geomorphic change detection), Tier 1, Channel Unit, and Channel Area summaries are optional and should be explored as needed for your watershed or for reviewing anomalies that were found after review of VISIT level metrics (e.g. if the Pool Area x Pool Volume graph showed anomalies, it might be useful to review the Tier 2 graphs to see what type of pool is causing the issue.

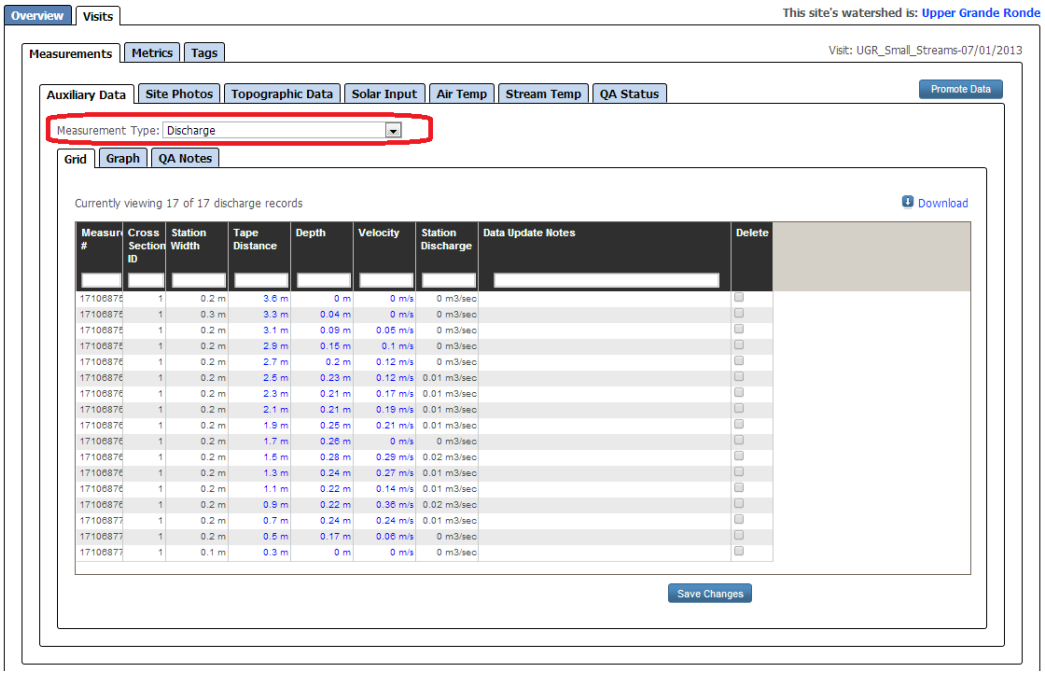
#	Metric Group	X axis	Y axis	Color Code
	Tier 2 Summary	Area	Volume	Data Quality Tier 1 Tier 2
	Tier 2 Summary	Average Bankfull Width or Site Length	Count	Data Quality Tier 1 Tier 2
	Tier 2 Summary	Average Bankfull Width or Site Length	Frequency	Data Quality Tier 1 Tier 2
	Tier 2 Summary	Average Bankfull Width or Site Length	Average Max Depth	Data Quality Tier 1 Tier 2
	Tier 2 Summary	Average Bankfull Width or Site Length	Average Residual Depth	Data Quality Tier 1 Tier 2
	Visit	Average Bankfull Width	All metrics that start with "GCD"	Data Quality

5

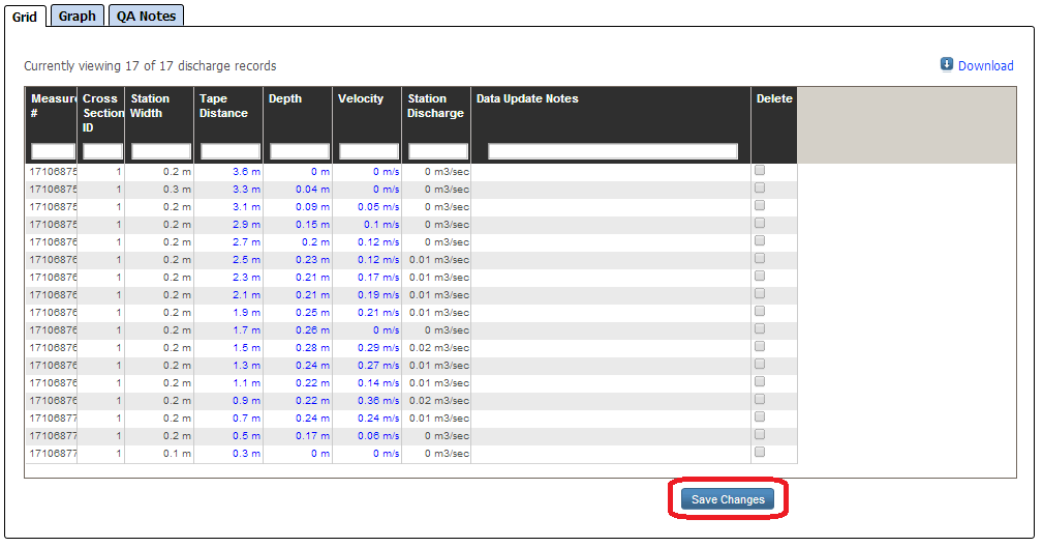


d. If an outlier is identified, mouse over the point to see the site and visit summary information. Or click the point to open a new tab with the underlying measurements.

e. In the new browser tab, review the measurements that participate in the derive metric value (see section 10 for description of mapping between measurements and metrics)



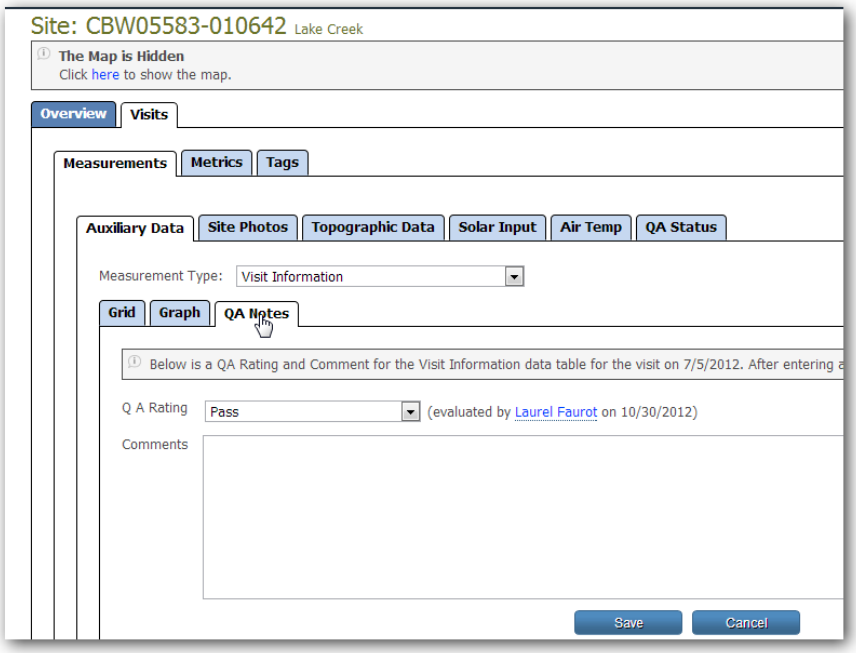
f. Update any spurious measurements. If the measurement data is correct, leave data alone. If the anomaly is prominent, it is worthwhile making a note of it in the QA Status notes OR in the Data Update Notes column of the Measurement table.



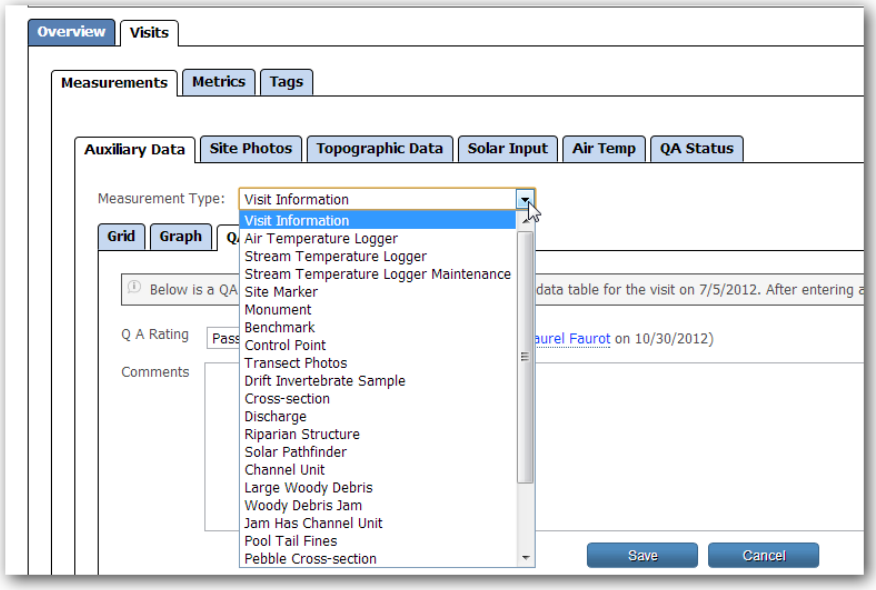
g. Be sure to **Save Changes** before moving to a different table or leaving the page.

h. Refresh the metric grid (Metrics calculations are updated when changes are detected to the underlying measurements. Re-calculation my take 24 hours for RBT metrics)
i. Repeat for all visits where the metric has an extreme or spurious value
j. Repeat this process metric-by-metric until all metrics have been reviewed
k. Set the QA Status for the following tables:
Visit Information
Discharge
Channel Unit
Topographic Data

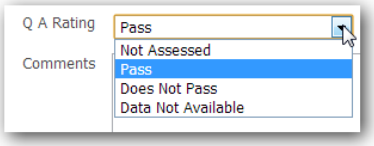
l. To set the QA Status for a table of a site, navigate to the Site Details page. Hold the "Ctrl" key and click the SiteId hyperlink for the that visit.
m. In the new browser tab, click on the QA Notes tab in Auxillary Data



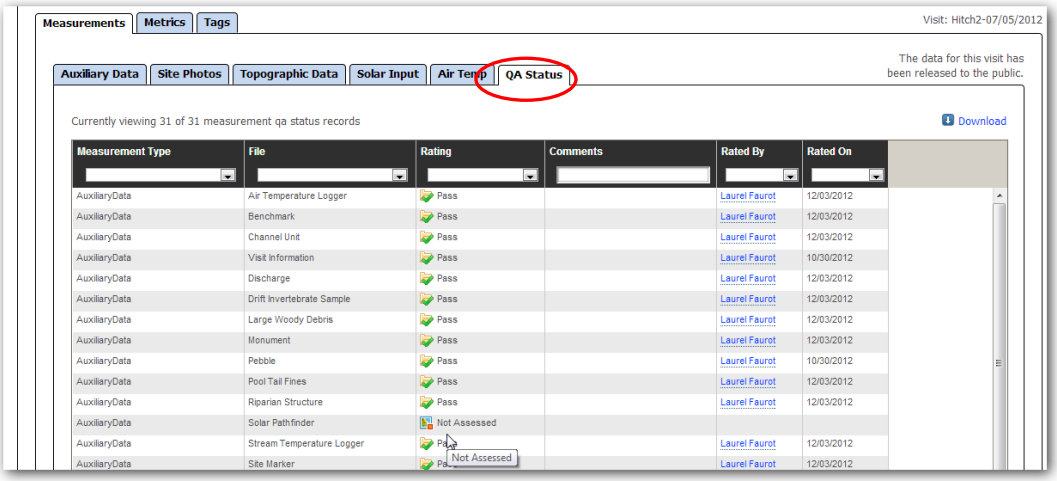
m. Select the Measurement Type from the dropdown menu that you wish to rate.



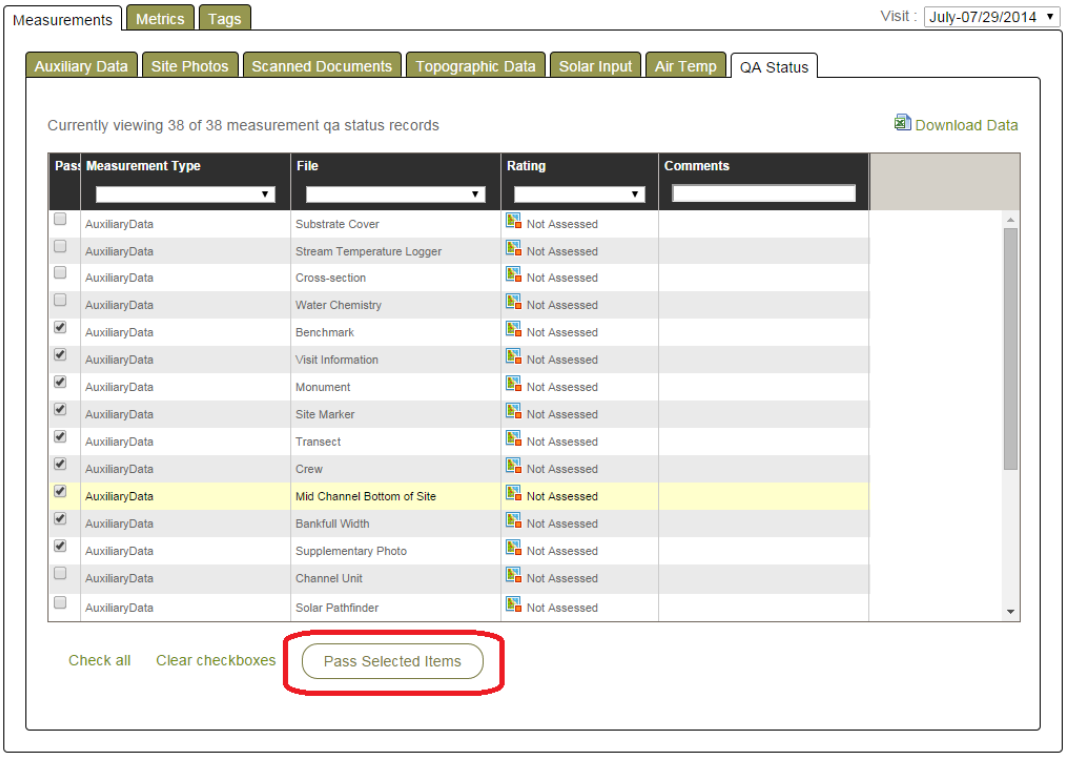
n. Assign the QA Rating by using the dropdown menu and add Comments as needed. Comments are especially important if data Does Not Pass. Save the edits.



o. Continue selecting Measurement Types and assigning QA Ratings to the prioritized Measurement Types listed in this document.
p. Once a site is complete, navigate to a new site and repeat this process to rate the prioritized Measurement Types of the new site.
q. QA Ratings can be reviewed by naviating to the QA Status tab of a site



r. To pass multiple Measurement Types at once, go to the QA Ratings tab. The left most column has a checkbox. Click the checkbox for each Measurement Type that you want to pass, then click “Pass Selected Items”



Step 6. Review Control Network

a. Review metadata information for monuments, benchmarks, control points, and markers. Note that elevations were reviewed during the Measurement Review in Step 3.
b. Review and update UTM coordinates as needed. Note that Benchmark and Control Point errors were likely repaired during Topo data review.
c. Review metadata within each table (e.g. marker types, benchmark retirement, etc) to ensure there are no outstanding control network questions in 2013.
c. Review and update crew notes as needed
d. Set the QA status for the following Measurement Types for each site:

- **Benchmark**
- **Site Marker**
- **Control Point**
- **Monument**

Step 7. Review Temperature Loggers and Metadata

a. Follow the instructions within the Stream Temperature QA Protocol to complete QA of these tables.

b. Set the QA status of the following tables once the metadata has been reviewed:

Air Temperature
Stream Temperature
Stream Temperature Logger Maintenance

Step 8. Additional Review of Measurements as Time Permits

For an additional level of quality assurance, review each auxiliary measurement table

a. Review each graph for outliers and nulls
OR
b. Click on each header name to sort values lowest to highest. Review all outliers and nulls.
c. Review images of RBT for high priority sites, such as repeat sites (annual panel sites), complex sites, or sites with high levels of survey difficulty (e.g. brushy or large sites).

Step 9: Promote Data for Each Visit

a. If data collected for the visit was for an AEM-specific or AEM+CHaMP Protocol, the AEM QA Process and Protocol should be completed PRIOR to promoting a visit.

b.
c. From the Metric tab on the Site Details page, click “Promote Data”
d. From the Visit tab on the Watershed page, track progress using Visit Phase column
e. Promote all visits within the watershed.
f. Document any NON-promoted visits in the QA status of the Visit table

III. Helpful Hints, Notes, and Tips

QA Process

1. The goal of the quality assurance process is to visually review the data for outstanding anomalies.
2. It is necessary to click the “Save Changes” button after editing cells. If you forget to click “Save Changes” and leave the Measurements tab, all of your edits will be lost.
3. It may be necessary to select a visit from the drop down menu before you begin editing data.

Graphs

4. Outliers will appear as yellow or red circles. Null values will be gray.
5. If the cursor is in the dropdown menu for graph selection and the item name is highlighted, use the up/down arrows on the keyboard to quickly scan through the graphs.
6. Clicking on any item in the legend of a graph will toggle it on/off in the graph display
7. Hovering over an item in the graph will display the visit information of the selected data.

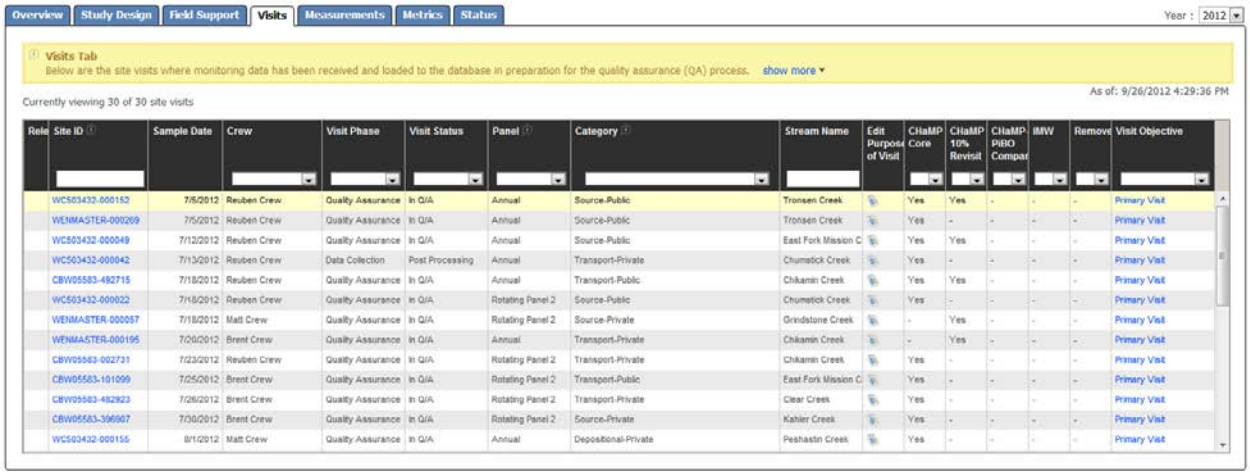
Webpage

8. Hiding the Map is just a click away. Click the light blue Hide Map link in the lower left of the map.
9. Holding the “Ctrl” key when clicking a link will open a new browser window.

IV. Introduction to Website Functionality

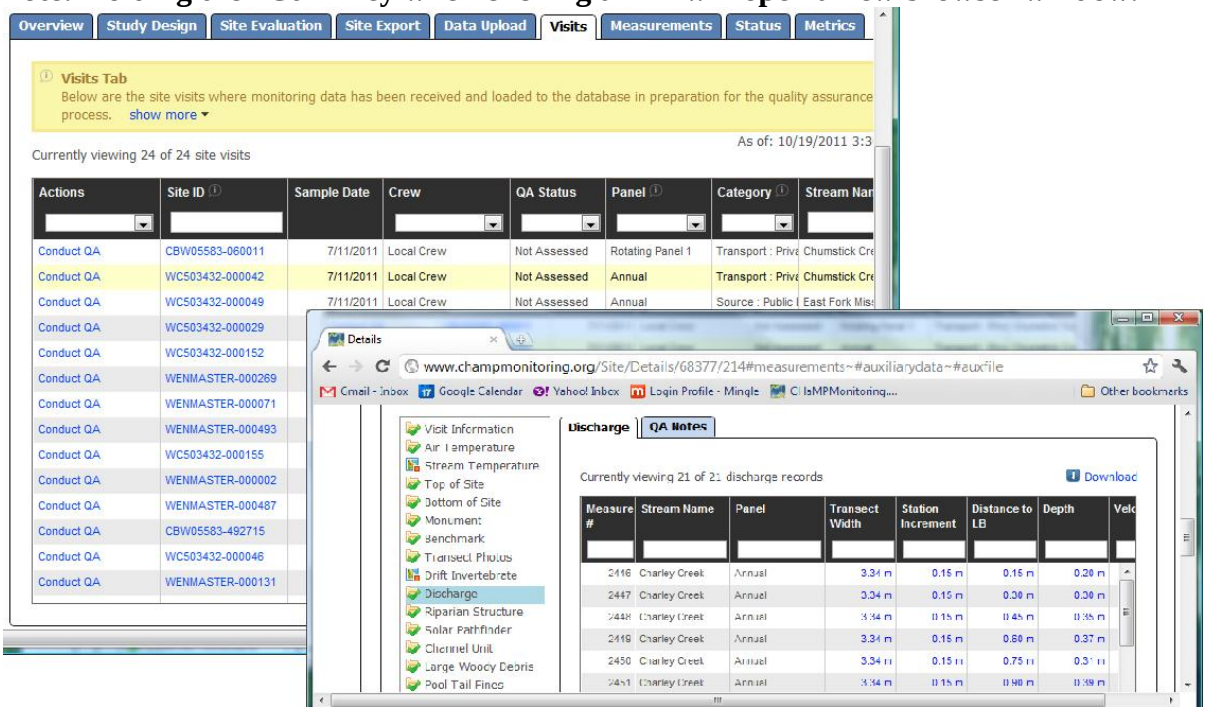
Visit Tab on Watershed Details Page

The visit tab provides a good view for tracking progress. This grid lists all visits that were planned for the current sampling year. Use the “Visit Phase” drop down to filter the list of visits by phase. Phase has three states (data collection, quality assurance, data approved). The goal is to get all visits to the “Data Approved” phase.



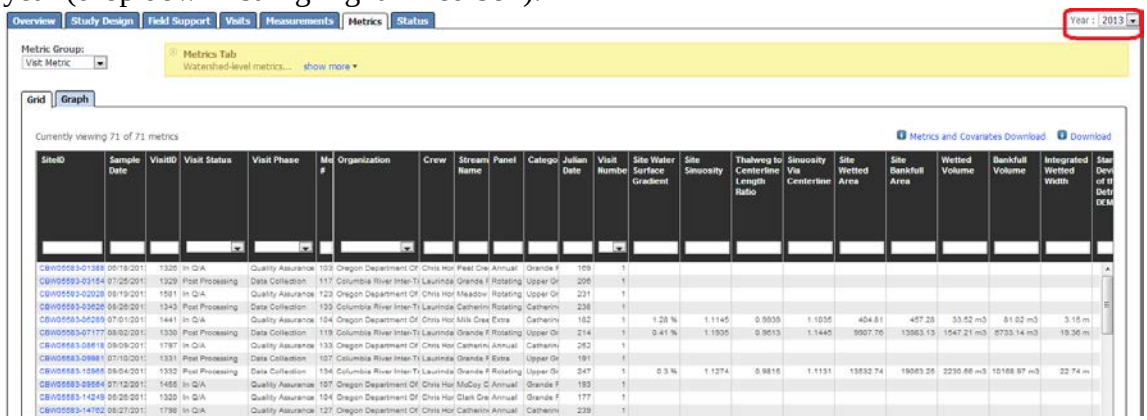
It may be helpful to have the Visit Tab open in one internet browser window and then open a second window to view the Site Details page.

Note: Holding the “Ctrl” key when clicking a link will open a new browser window.

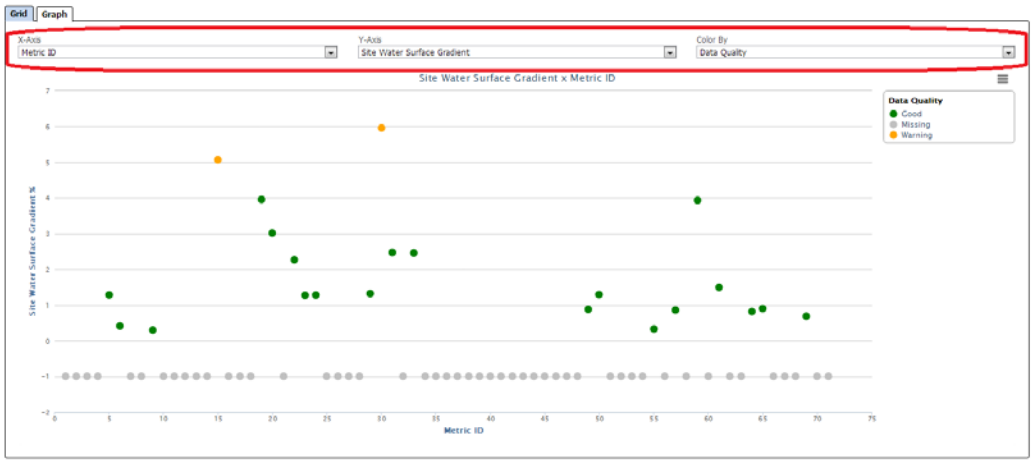


Watershed Details Page – Metrics Tab

1. From the Watershed menu, to navigate to your watershed page.
2. Click the Metrics Tab
3. This will display grid with calculated metrics for all visits from the selecting sampling year (drop down list highlight in red box).



4. The grid has functionality that will help you explore and edit the data:
    a. Clicking the name of any column will sort the column of data.
    b. Entering a value in the white filter box will limit the rows of data showing in the grid (e.g. enter the right 6 digits of the SiteID to filter for a single site).
    c. Using the greater than (>) or less than (<) symbol and a number will filter the grid for all rows were that column has a value matching that criteria
5. The second tab displays a graph.
    a. Three drop-down menus are available to configure the graph
        i. x-axis drop down – contains a subset of metrics that are indicative of channel size or other predictive metrics
        ii. y-axis drop down – contains the full set of derived metrics
        iii. color by drop down – contains sites covariates which may be useful for interpreting for filtering data

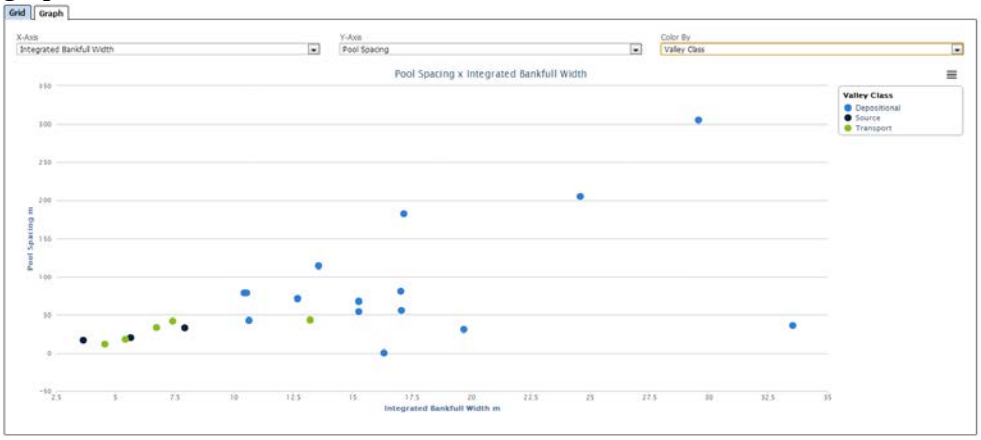


    b. The default for the x-axis is Metric ID, which will generate an index or y-scatter plot. It is recommended to use Metric Id as the x-axis for quality assurance review, as this encourages unbiased review of individual metric

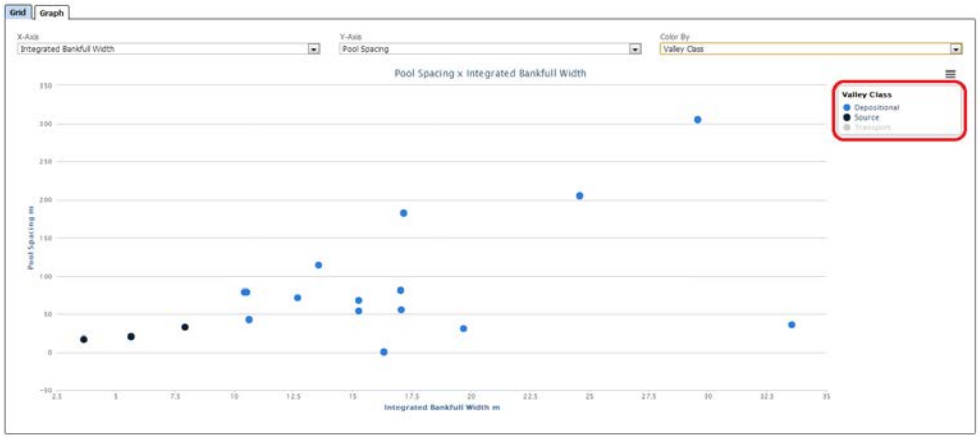
values. If there is a known relationship between two metrics, then plotting the independent variable on the x-axis can be help in quality assurance review.

c. The default for Color By is Data Quality. This will plot points as green, yellow, or red based on thresholds established by the program QA team. Yellow points are suspiciously high. Red points are likely invalid values for the given metric. The color coding is intended to draw reviewers eyes to the points, however, are should not be interpreted as hard-n-fast rules. Feedback during the 2013 end-of-season review will help refine the thresholds for 2014.

d. Use the Color By drop down to review and filter data by a covariate. After a covariate is select from the Color By drop down, a legend will be added the graph. Click an item in the legend to hide the corresponding points from the graph. Here is the non-filtered version.

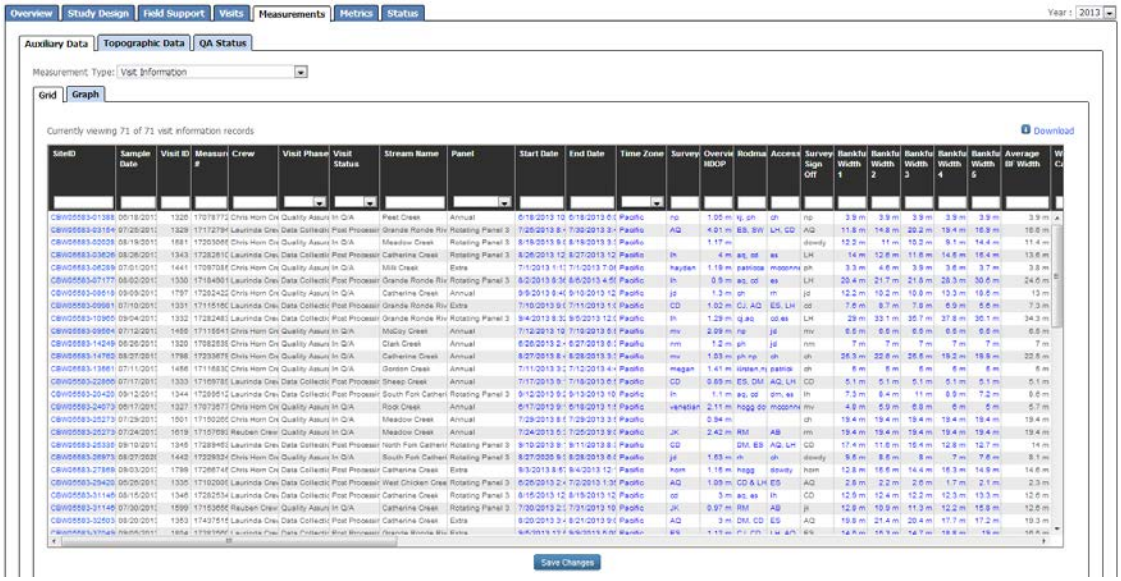


Here is the filtered version, where “Transport” sites are not displayed.



Watershed Detail Page – Measurements Tab

1. From the Watershed menu, to navigate to your watershed page.
2. Click the Measurements Tab
3. This will display the auxiliary data compiled across the watershed



The Measurements Tab has a measurement type drop down which lists each table. Selecting an item from the drop down will display the appropriate table in the grid. The grid has functionality that will help you explore and edit the data:

a. Clicking the name of any column will sort the column of data.
b. Entering a value in the white filter box will limit the rows of data showing in the grid (e.g. enter the right 6 digits of the SiteID to filter for a single site).
c. Using the greater than (>) or less than (<) symbol and a number will filter the grid for all rows were that column has a value matching that criteria

Editing values in the grid:

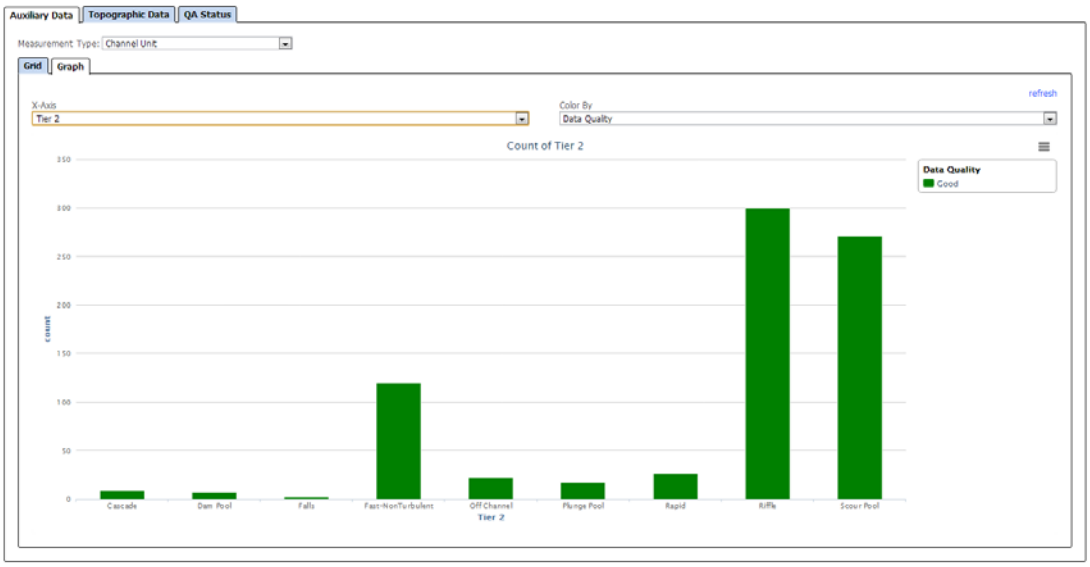
a. Clicking in any cell will allow you to edit the value for that cell.
b. It is necessary to click the "Save Changes" button after editing cells. If you forget to click "Save Changes" and leave the Measurements tab, all of your edits will be lost.

Charting data:

a. The chart control is located in a separate tab. Selecting a column name from the dropdown menu will plot that data in the chart.
b. Numeric data will be plotted as a y-scatter plot, where the x-axis is the Measurement # and the y-axis is the numeric value for the column you selected. The purpose of the graph is to quickly plot the data and look for outliers.

Note: Outliers will appear as yellow or red circles. Null values will have no color. Clicking on a point will open a new tab to the Site Details page.

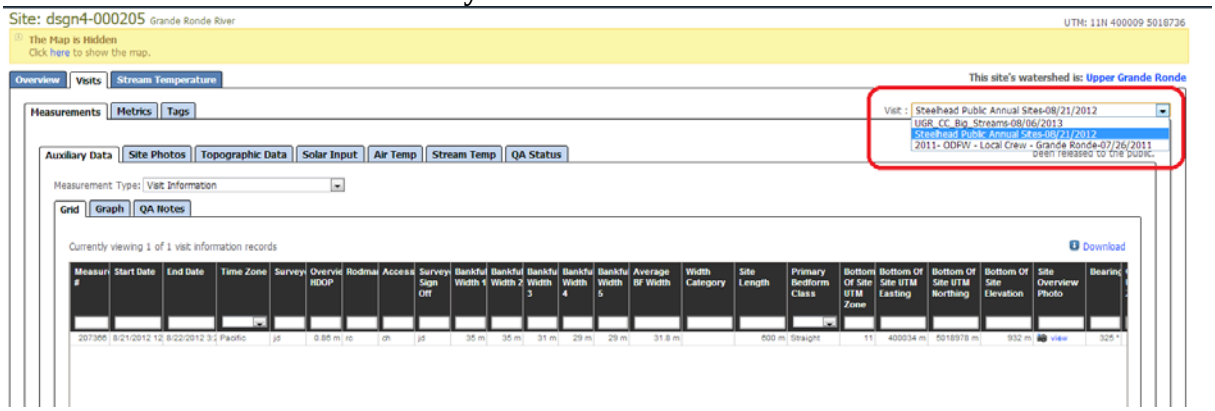
c. Categorical data will be plotted as a horizontal bar-chart, where the x-axis displays the categories and the y-axis displays the number of rows corresponding to that category.



Site Details Page

If a spurious value is identified while reviewing metrics at the watershed-scale, it will be necessary to drill into that visit and review the measurements. Clicking the light blue SiteID (e.g. CBW05583-013882) from any grid will bring you to the Site Details page with the appropriate visit selected. From the Site Details page, go to the Measurements Tab. From this tab, you will be able to view, graph, and edit data for each table.

Note: Holding the "Ctrl" key when clicking a link will open a new browser window.
Note: The visit selector will allow you to switch between visits at the same site.



Editing values in the grid:

a. Clicking in any cell will allow you to edit the value for that cell.
b. It is necessary to click the "Save Changes" button after editing cells. If you forget to click "Save Changes" and leave the Measurements tab, all of your edits will be lost.

You are encouraged to provide a QA Ranking and Comment for each table. This ranking and comment applies to the individual visit only.