CUAHSI

UNIVERSITIES ALLIED FOR WATER RESEARCH

# STANDARD UPLOADING GUIDE

**Time Series and Sensor Data Publication on data.cuahsi.org**

**Version 2.0**

**Prepared by**
**Liza Brazil, Community Support Specialist**

**February 2018**

# CONTENTS

Contents ..... 2
Disclaimer ..... 3
Introduction and Purpose of This Document ..... 4
Workflow for Publishing Data ..... 4
Create Publishing Account ..... 4
Uploading The Data ..... 5
Uploading Metadata ..... 5
Uploading data Values ..... 8
Viewing and Editing Data in the Database ..... 8
Publish Your Data ..... 9
Appendix A: The Observations Data Model (ODM) ..... 9
Appendix B: Required and Optional Tables ..... 11
Appendix C: Controlled Vocabularies in the ODM ..... 11

# DISCLAIMER

*The CUAHSI Water Data Services is funded by the National Science Foundation* to *provide services to discover, retrieve, and publish water data. This material is based upon work supported by the National Science Foundation (NSF) under Grant No. 13-38606. Any opinions, findings and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the NSF.*

# Introduction and Purpose of This Document

The CUAHSI Hydrologic Information System (HIS) enables data uploading (HydroServer) and data discovery (HydroClient). This document describes how to create a publishing account, upload data, and request publication to make your data accessible to the public on HydroClient. Before proceeding with uploading your data, you must format it to fit with one of the two CUAHSI formatting options: The Standard Format Option or The Advanced Format Option. The Standard Format Option is a subset of the Advanced Format Option. Instructions on how to format your data and which format option to select are provided in the CUAHSI Formatting Guide.

The HydroServer provides two uploading options that correspond to the two options for formatting data. The Standard Upload option involves uploading only the required tables: Variables, Sites, Sources, Methods, Quality Control Levels, and Data Values. Refer to the Advanced Uploading Guide for instructions on uploading the full metadata profile, including all required tables and any optional metadata tables, e.g. Samples, LabMethods, Categories, Qualifiers.

# Workflow for Publishing Data

How to publish data in CUAHSI HIS:

1. Create a publishing account
2. Verify your account using the activation email
3. Format your data: Follow the Guide and fill in the Excel Templates (Standard or Advanced)
4. Upload your data: Follow the Guide (Standard or Advanced) to complete the process
5. Request Publication: Click Request Publication on the HydroServer Homepage to make your data service accessible to the public on http://data.cuahsi.org
6. For all subsequent uploads, data is published every Saturday automatically unless requested otherwise

Questions? Contact CUAHSI support at help@cuahsi.org

## Create Publishing Account

You will need a Google Account to create a publishing account. The Google Account you use when creating a publishing account will be associated with the HydroServer. You may decide to create a shared Google Account for your organization or you may have several individual Google Accounts linked to one database.
To create a publishing account, go to http://hydroserver.cuahsi.org/ and click Create New Publishing Account. Fill out the required account information as described below.

- Service Name: An abbreviated name for your data service. Example: NWISDV
- Service Title: The full name of your data service. This will be displayed to the public. Example: NWIS Daily Values
- Service Abstract: A detailed description of your data service and the data.
- Contact Name: Name of the person that the public should contact with questions about the data.
- Contact Email: Email of the person that the public should contact with questions about the data.

- Contact Phone: Phone number of the person that the public should contact with questions about the data.
- Organization: Name of the organization responsible for publishing the data.
- Organization Website: Website address of the organization responsible for publishing the data.

**Note:** CUAHSI Staff will use the information from your publishing account to create an HIS Central Data Service page. This will list you among all data service providers in the CUAHSI Catalog. CUAHSI Staff will provide you with credentials to edit this information at any time.

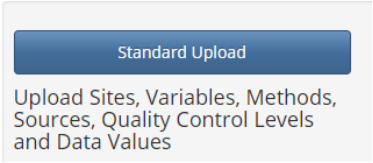
## Uploading The Data

Standard uploading is broken up into two processes: (1) upload metadata files (2) upload data values files. The process is identical for both metadata and data value uploading but it is important that you first upload metadata before moving on to data values.

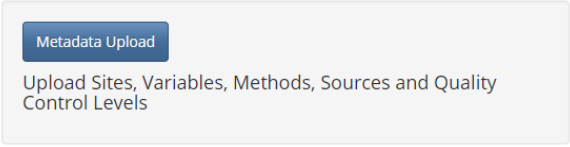
1. Browse to or drag and drop all metadata files as CSVs
2. Begin Upload to validate that you your metadata files have the correct and required headers from the CUAHSI Formatting Guide
3. Continue to insert valid metadata files and check for errors in the formatting
4. Fix up to 25 rows of errors in the browser and re-upload
5. Repeat for data values once associated metadata values are inserted

### Uploading Metadata

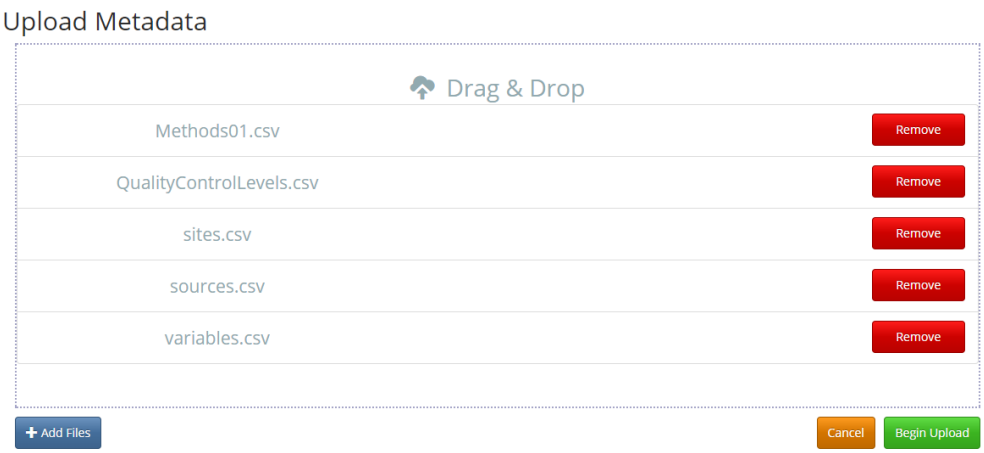
To get started, click on the Standard Upload option as shown below.




You are required to upload all metadata before uploading any associated data values. Click on the **Metadata Upload** button as shown below.




Drag and Drop all metadata files as shown below.




Click **Begin Upload** or click **Remove** if you have selected the wrong file. The HydroServer will check the uploaded files to ensure that:

1. The files contain the correct headers required in the Standard metadata templates
2. The files are not missing any headers required in the Standard metadata templates

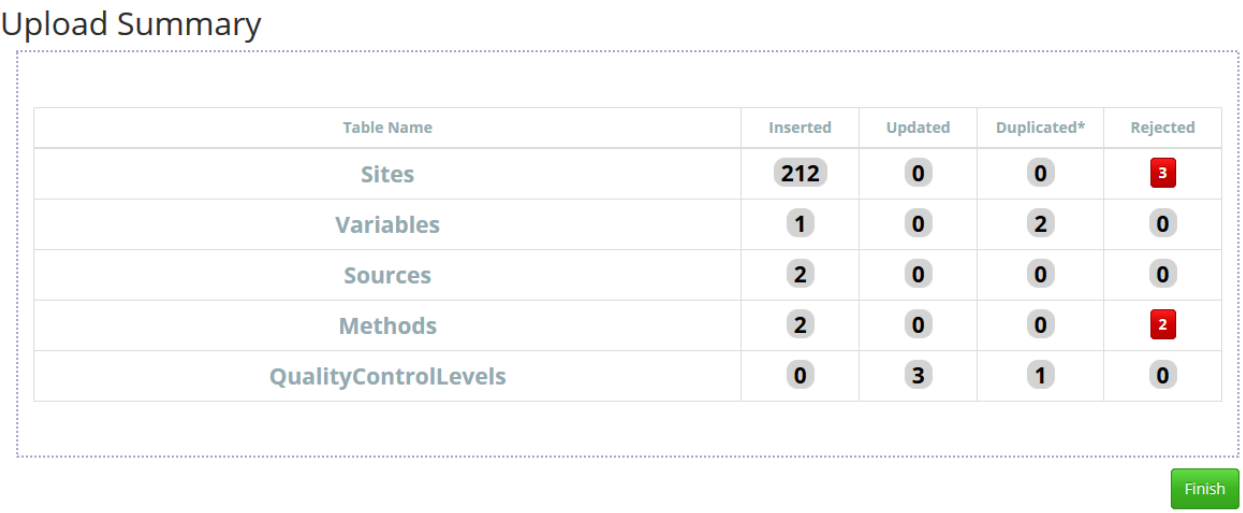
Once all files have finished uploading, click **Continue.** The Upload Report should appear with information on whether the files are OK or have errors. If you encounter an error, click on the row to view feedback on why the file was not accepted. For example, below shows a Methods file that contains an error because it is missing the MethodDescription header that is required in the Methods table.

You may continue by clicking **Complete Upload** to upload the valid files and disregard the invalid Methods file. Or, you can click **Cancel**, fix the Methods file, and upload all files again. This example will skip to the next step and assume the Methods table was reuploaded with the required headers. After clicking **Complete Upload**, the HydroServer will check the contents of the files. The Upload Summary describes the number of records by table that are:

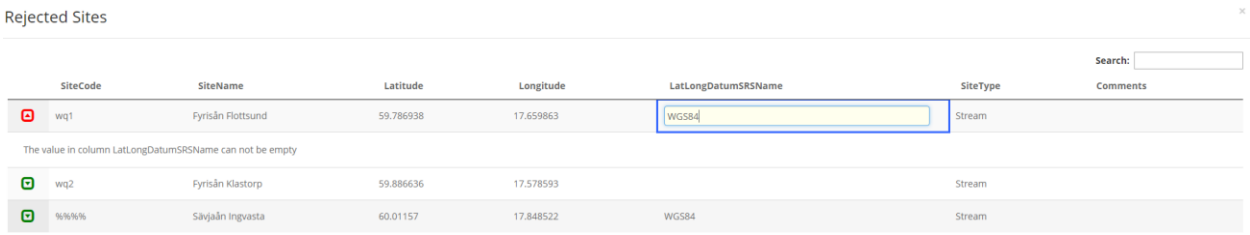
- New: Valid records ready to be committed to the database.
- Rejected: Records that could not be validated by the application.
- Updated: Records that have been updated because the uploaded record had a previously used key with other, changed metadata that are ready to be committed to the database.
- **Duplicate**: Records that are a complete match of records that have been previously committed to the database.

**Note:** The HydroServer Uploader reports on and does not insert duplicate metadata, however the HydroServer does not report on duplicate data values. Instead, all valid data values are inserted and duplicates are checked for and removed automatically on a weekly basis. This process helps to increase the speed of the upload.

An example of the Upload Summary table is shown below. Notice there are 3 records that have been rejected in the Sites table and 2 records in the methods table.




Edit the Rejected records by clicking on the rejected column. A pop up window will appear with a red drop down arrow that allows you to edit the row. Click on the red arrow to view information on why the record was rejected. In this example, the LatLongDatumSRSName is empty. Click to select the cell under LatLongDatumSRSName, to enter the correct LatLongDatumSRSName as shown below. This example shows the correct LatLongDatumSRSName as WGS84.




Click on the remaining rows to review the error and edit the necessary cells. Once all rows are corrected, you may click **Re-Upload.** Alternately, you may decide to click **Download** to correct the errors in Excel before re-Uploading. Once the data has been re-uploaded, the Upload Summary should reflect the corrections and show the increased number of Inserted records. Click **Finish** to navigate back to the HydroServer Homepage and continue to upload Data Values.

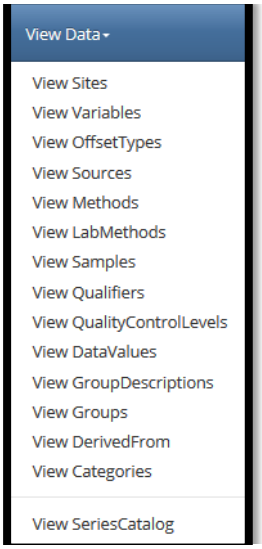
**Note:** You may edit up to 25 records at a time. For files that have more than 25 records with errors, you are required to download the file and re-upload once corrected. The downloaded file will contain a column with errors describing why the record was rejected.

## Uploading data Values

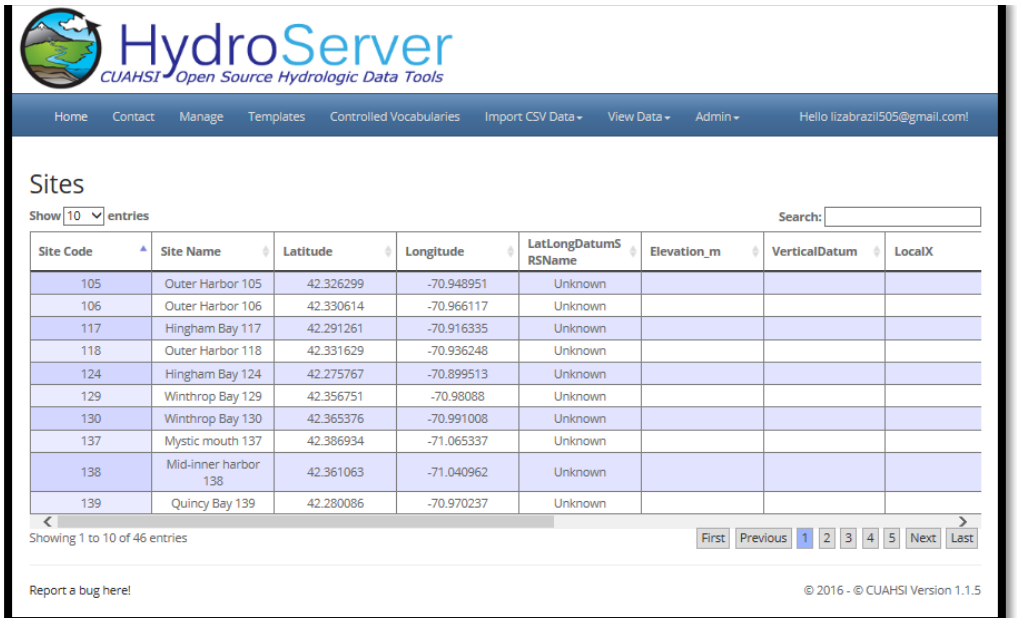
To upload the data values, follow the same steps as for uploading metadata. To get started, navigate back to the Standard Upload page and click on **Data Values Upload**.

## Viewing and Editing Data in the Database

To view data that have already been loaded into the database, click on View Data in the top menu, then select the table that you wish to view.




The resulting webpage will allow you to view, search, and sort through data that have been committed to the database.




Editing the contents of a database requires a new upload. For Sites, Variables, Methods, Sources, and QualityControlLevels, uploading a record with a previously used code (SiteCode, VariableCode, MethodCode,SourceCode, and QCLevelCode) will update the corresponding record in the database with

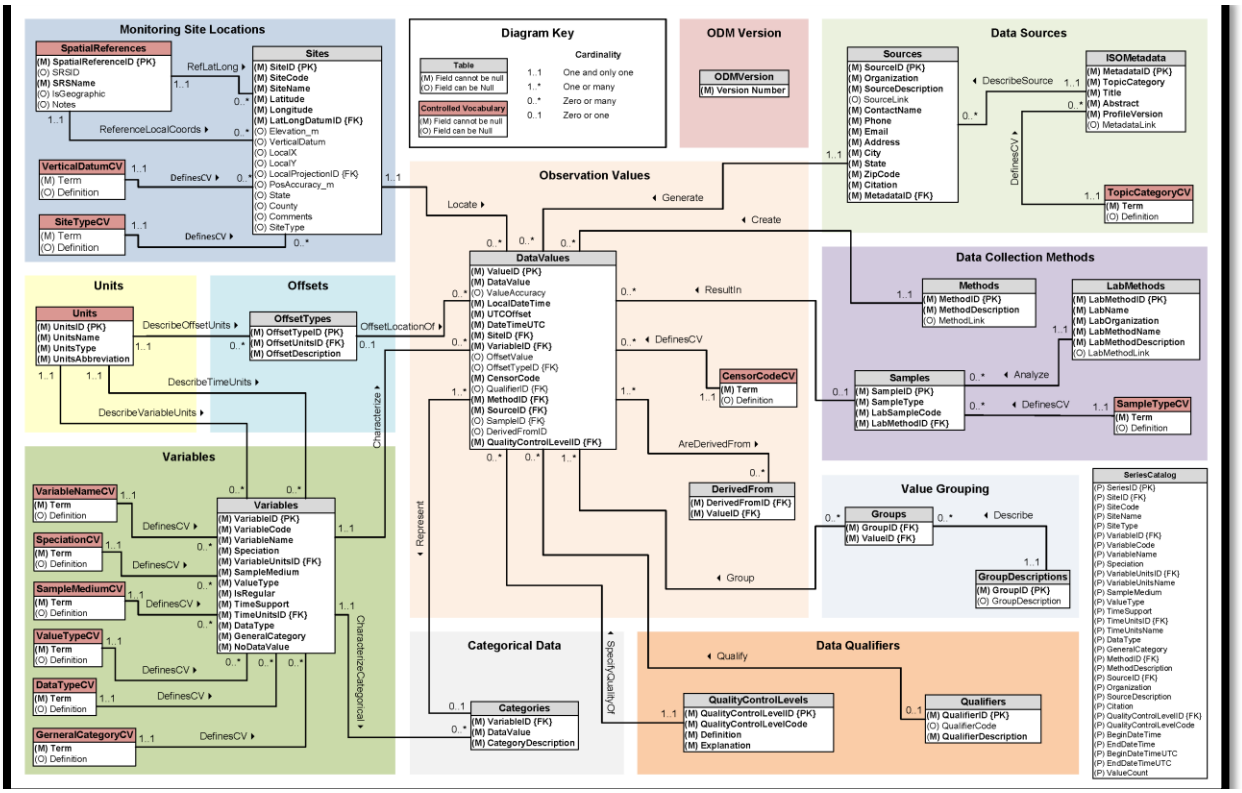
the information from the new upload. Such records will be presented in the validation step during upload under the *Updated* column. Edits to the Data Values must be performed by contacting help@cuahsi.org.

### Publish Your Data

Once you are ready to publish your data to be discovered on http://data.cuahsi.org/, click **Request Publication** on the HydroServer homepage. A request will be sent to help@cuahsi.org to publish your data. Expect a response from help@cuahsi.org with a link to review your data on a private version of http://data.cuahsi.org/. Once you have reviewed and confirmed to help@cuahsi.org , CUAHSI staff will publish your data and create an HIS Central Data Service page that contains the information you provided when creating a publishing account. CUAHSI Staff will provide you with login information to access your HIS Central Data Service page and make any edits to the information.

**Note:** Data services are harvested once a week. If a data publisher needs their data to be harvested prior to the next scheduled harvest they can send a request to help@cuahsi.org.

# Appendix A: The Observations Data Model (ODM)




The Observations Data Model (ODM) is the information model employed by the CUAHSI HIS. The most common implementation of it is as relational database in Microsoft SQL. The core of the model comprises of a center table that contains the value of observations as well as foreign keys to ancillary tables. These tables provide metadata with the goal of unambiguous interpretation of the data values and include tables with information related to the:

- Location of the observation (*Sites*)
- Phenomenon being observed (*Variables*)
- Methods being employed (*Methods*)
- Sources of the data (*Sources*)
- Quality control techniques employed (*Data Qualifiers*)

The ODM is described in a peer-reviewed article in Water Resources Research and can be accessed here.

## Appendix B: Required and Optional Tables

| Table Name | Table Description |
|---|---|
| *Variables* | The Variables template lists the full descriptive information about what |
| *Methods* | The Methods template lists the methods used to collect the data and any |
| *Sites* | The Sites template provides information giving the spatial location at which |
| *Sources* | The Sources template lists the original sources of the data, providing |
| *Samples* | The Samples template gives information about physical samples analyzed in |
| *LabMethods* | The LabMethods template contains descriptions of the laboratory methods |
| *Quality Control* | The QualityControlLevels template contains the quality control levels that |
| *DataValues* | The DataValues template contains the actual data values and keys to |
| *Categories* | The Categories template defines the categories for categorical variables. |
| *DerivedFrom* | The DerivedFrom template contains the linkage between derived data |
| *GroupDescriptions* | The GroupDescriptions template lists the descriptions for each of the |
| *Groups* | The Groups template lists the groups of data values that have been created |
| *Qualifiers* | The Qualifiers template contains data qualifying comments that accompany |

Required tables are orange and optional tables are green in the above.

## Appendix C: Controlled Vocabularies in the ODM

Within the ODM, certain fields have been designed as controlled vocabularies, which are community driven and moderated by CUAHSI staff. Click here to visit the landing page for the Master Controlled Vocabulary Registry for ODM 1.1.
The list of fields that are controlled vocabularies can be seen below. These fields are listed by template and hyperlinked to the appropriate web page to view, submit edits, or submit new terms:

### Variables

- VariableName
- Speciation
- VariableUnitsName
- SampleMedium
- ValueType
- TimeUnitsName
- DataType
- GeneralCategory

### Sites

- LatLongSRSName
- LocalProjectionSRSName

## Sources

- TopicCategory

## Samples

- SampleType

## DataValues

- CensorCode