

# Data Submission Guidelines

## **Data Recommendations:**

### **1. Observation Data**

Observation data can be represented by single measurements or time series. Hydrologic observations are identified by three basic characteristics: space, time, and variable. In addition to these characteristics, the data quality and the description of measurement method are very important in the observation data description. Data quality is a major concern for SAHRA researchers and refers to the accuracy and reliability of measured or calculated values and their description. Each set of measured data must be accompanied by information on data type and units, uncertainty estimation, spatial and temporal locations/resolutions, measurement/generation method, quality assurance, and data custodian, etc. Table 1 represents attributes that briefly describe the measured quantity. A more detailed description of methods, procedures, and quality control can be provided in the supplemental information element of the metadata file (see the SAHRA Metadata document for guidelines on preparing the metadata file: [http://sahra.arizona.edu/research\\_data/SAHRAGeoDB/DataMeta/MetadataDescription.doc](http://sahra.arizona.edu/research_data/SAHRAGeoDB/DataMeta/MetadataDescription.doc) ).

### **2. Raster/Grid Data**

Grid data represent the spatial distribution of a variable (e.g., temperature, precipitation). These data are usually derived from point observations or satellite images and should be represented in the recommended file formats and accompanied with a detailed description of methods, procedures, and quality control in the metadata file ([http://sahra.arizona.edu/research\\_data/SAHRAGeoDB/DataMeta/MetadataDescription.doc](http://sahra.arizona.edu/research_data/SAHRAGeoDB/DataMeta/MetadataDescription.doc) ).

### **3. File Formats**

Please contact the database administrator (DBA) at [mdurcik@hwr.arizona.edu](mailto:mdurcik@hwr.arizona.edu) if you want to use file formats other than those listed below:

- Spreadsheets  
*MS Excel, Quattro Pro*
- Delimited text files
- Database files  
*MS Access, dBase*
- Geographical data  
*ArcGIS shapefiles, personal database, coverages and interchangeable files*
- Raster data files  
*TIFF, JPEG, ASCII, BIL, ESRIGrid and other binary raster files*
- Triangulated Irregular Network (TIN)
- NetCDF

**Table 1** Attributes that describe measured/calculated values  
(derived from attributes proposed by Horsburgh et al., 2005)

<b>Attribute</b>	<b>Description</b>
Value	The observation value
Uncertainty	A quantitative indication of the data quality (e.g., a combination of uncertainty type A and B, see the NIST Technical Note 1297 at <a href="http://physics.nist.gov/cuu/Uncertainty/basic.html">http://physics.nist.gov/cuu/Uncertainty/basic.html</a> )
Variable	The physical quantity that the value is measuring (e.g., streamflow, precipitation, length, volume or time)
Units	The units (e.g., meters (m) or square meters (m <sup>2</sup> )) associated with the variable
Data Type	An indication of the kind of quantity being measured (e.g., an instantaneous or cumulative measurement)
Value Type	An indication of whether the value represents an actual measurement, a calculated value, the result of a model simulation, interpolated, or missing
Date/Time	The date and time of the observation (including the time zone in which it occurred or offset relative to UTC)
Location	The location of the observation (i.e., latitude and longitude)
Interval	The temporal interval over which the observations were collected or implicitly averaged by the measurement method and whether the observations are regularly recorded on that interval
Offset	Distance from a reference point to the location at which the observation was made (e.g., 5 meters below water surface)
Offset Type/ Reference Point	The reference point from which the offset to the measurement location was measured (i.e., water surface, stream bank, snow surface)
Sample Medium	The medium in which the sample was collected (e.g., water, air, sediment,)
Data Qualifying Comments	Comments accompanying the data that can affect the way the data is used or interpreted (e.g., holding time exceeded, sample contaminated, provisional data subject to change)
Analysis Procedure	An indication of what method was used to collect the observation (e.g., dissolved oxygen by field probe or dissolved oxygen by Winkler Titration)
QA/QC	An indication of the quality of the data
Censoring	An indication of whether the observation is censored or not
Organization	The organization or entity providing the measurement (e.g., data custodian)
Source Database	An indication of the original source of the observation (e.g., USGS NWIS, EPA STORET, local investigator)

## **Data Submission – What should be included?**

Data custodians are responsible for data and metadata quality and completeness. Submitted data and metadata will be stored in the SAHRA Geo-Database, and data files will be archived. Each data submission should contain:

**a. Metadata**

Description of data created using recommended metadata standards (ESRI FGDC/ISO and CUAHSI profile based on ISO 19115). Under certain circumstances, metadata may be created using the minimum metadata profile. See guidelines at [http://sahra.arizona.edu/research\\_data/SAHRAGeoDB/Docs/MetadataDescription.doc](http://sahra.arizona.edu/research_data/SAHRAGeoDB/Docs/MetadataDescription.doc).

**b. Data**

Data stored in recommended file formats with specifics on how data are stored in the submitted file(s).

**c. Description of attributes**

The definition of attributes in tabular form (e.g., variable, quantity, unit, etc.)

**d. Geographical representation of measuring/modeling points/area**

In the form of lat/long coordinates stored in the data file, spatial feature classes (e.g., shapefile, personal database, etc.) or raster data files. Description of attributes and geographical projection should be attached in a separate file.

**e. Personal information**

Name, email address, and affiliation

**f. Formal agreement with the SAHRA Data Policy**

<http://sahra.arizona.edu/about/datapolicy.html>

## **Data submission modes**

Data can be submitted using one of the following modes:

**a. Database website**

Uploading files to server via [http://sahra.arizona.edu/research\\_data/SAHRAGeoDB/](http://sahra.arizona.edu/research_data/SAHRAGeoDB/).

**b. Email**

Contact DBA at [mdurcik@hwr.arizona.edu](mailto:mdurcik@hwr.arizona.edu). This option is good for small files up to 10 MB.

**c. Regular mail**

Using storage media, such as CD or DVD.

**d. Direct Database access**

Contact database administrator to obtain database access (username and password) and connection details.

## **Reference**

Horsburgh, J.S., D.G. Tarboton, and D. Maidment. (2005) Hydrologic observation data, in *Hydrologic Information System Status Report*, ed. by D. Maidment, CUAHSI, Web access <http://www.cuahsi.org/docs/HISStatusSept15.pdf>.