Hydroinformatics

Assignment 3
Data Model Design

Due Date: October 6, 2016

Learning Objectives

1. Develop data models to represent, organize, and store data
2. Design and use relational databases to organize, store, and manipulate data

Computer and Data Requirements

1. Data for this exercise are available in a zip file on the course Canvas website.
2. MySQL Workbench software. You can download and install the MySQL Workbench software using the instructions provided on the course Canvas website.

The Problem

A group of researchers recently deployed several instruments to continuously monitor streamflow and water quality at multiple monitoring sites in 3 watersheds located in northern Utah. The instruments report measurements in numerous datalogger data files that the researcher must now regularly retrieve, organize, quality-control/quality-check, aggregate, and manipulate before they can perform further analysis. Design a logical data model to represent all of the data contained within and metadata associated with the data files from all of the monitoring sites, and that when physically implemented, will allow the researchers to automate the retrieval and storage of the data. The data and metadata files are available on the course Canvas website.

Deliverable

Provide a one-page briefing report along with a full-page entity-relationship diagram that shows your logical model design. In presenting your design:

1. Provide an introduction to the problem.
2. Describe the methods you used to develop your design.
3. Describe your results:
    a. Describe the entities and relationships that you have included in your data model.
    b. Explain how you will structure the metadata to avoid repetition.
    c. Overview the software technology, file formats, etc. you will use to organize the data and implement your data model.
    d. Describe how you could make it easier to get data into and out of your data model.
4. Provide a brief summary/conclusion section that specifies whether/how your data model design will facilitate querying and retrieval of subsets of data.
5. Provide a full page entity-relationship diagram as an appendix to your writeup that shows the entities needed to describe the data, their attributes, and the relationships between them.