DATA MANAGEMENT

QA/QC procedures

Water Resources Research Center Workshop:
Continuous Stream Temperature and Flow Monitoring
University of Massachusetts, Amherst, MA
November 5, 2014

DATA STORAGE

Set up a **good record keeping** and **data storage** system.

Retain original raw data files.

Save the file that you are manipulating **with a different file name** so that you don’t confuse it with the original raw data file.

SENSOR SET UP

The following practices will make data processing and screening easier and more efficient:

- Set the sensors up so that they start recording on the hour (xx:00) or half hour (xx:30)
- Set the units to degrees Celsius
- Set the air and water temperature sensors up so that they record at the same time
- Consider using military time (if this is an option) to avoid potential confusion with a.m./p.m.

FORMAT THE DATA

It is helpful to use a consistent template

- easier to merge datasets
- easier to calculate summary statistics using pivot tables

TRIM THE DATA

- Reference field form to find what time the sensor was deployed in the field

CHECK FOR MISSING DATA

- Pivot table (count = 48/day if 30-minute interval is used)
- Plot

ACCURACY CHECKS

- Reference field form, enter QC field measurements into spreadsheet

Let’s start with the water temperature file:

HRCC_WaterTemp_20130529

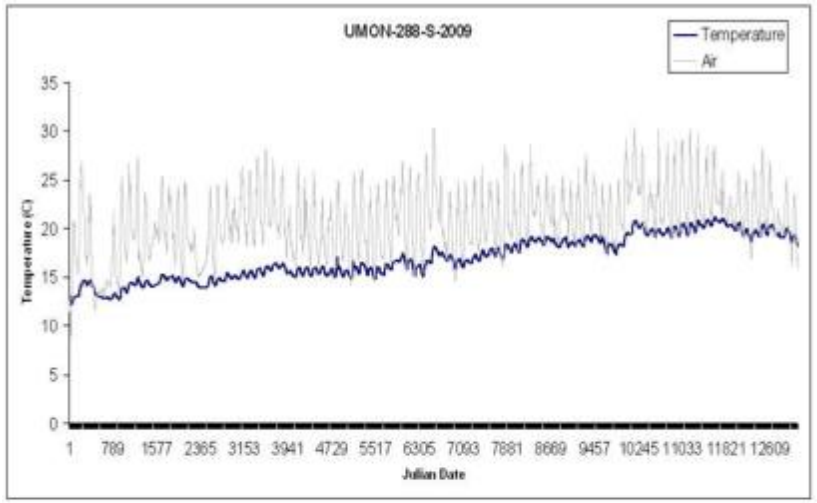
Now let’s work with the air temperature file:

HRCC_AirTemp_20130529

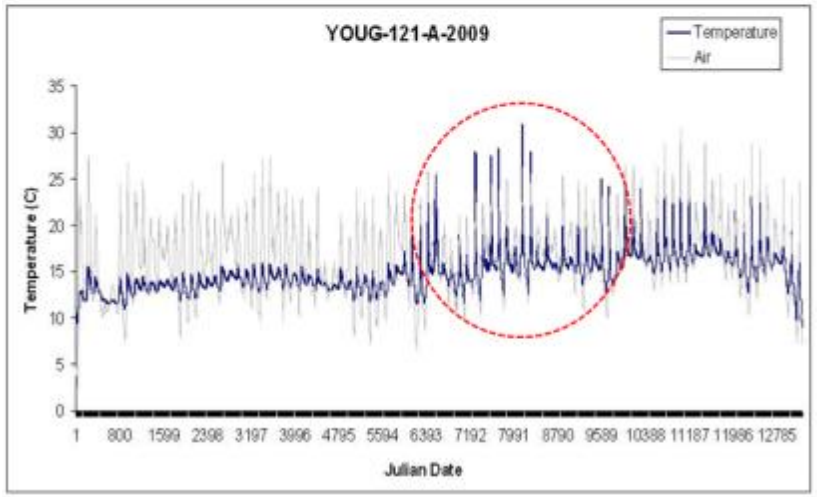
Now let’s go to the ‘HRCC_Combo’ file

MERGE WATER AND AIR TEMPERATURE DATASETS

- Plot together



Looks good!



Dewatering event (water temperature matches air temperature)

Graphs provided by MDDNR

SUMMARY STATISTICS

- Daily
- Monthly
- Seasonal

COMPARE WITH DATA FROM NEARBY USGS GAGE

- Plot

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01187300 - USGS Water Data for the Nation
waterdata.usgs.gov/.../uv/?...01187300... United States Geological Survey
Friday, August 15, 2014 through Sunday, August 17, 2014 The USGS in Reston, VA is moving the computer facilities. We expect all Water Data for the Nation to ...

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PROVISIONAL DATA SUBJECT TO REVISION

Available data for this site Time-series: Current/Historical Observations GO

This station managed by the East Hartford, CT Field Office.

Available Parameters	Available Period
All 4 Available Parameters for this site	
00060 Discharge	2007-10-01 2014-11-04
00065 Gage height	2007-10-01 2014-11-04
00010 Temperature, water	2011-11-05 2014-11-04
00020 Temperature, air	2011-11-05 2014-11-04

Output format

- Graph
- Graph w/ stats
- Graph w/o stats
- Graph w/ (up to 3) parms
- Table
- Tab-separated

Days (7)

-- or --

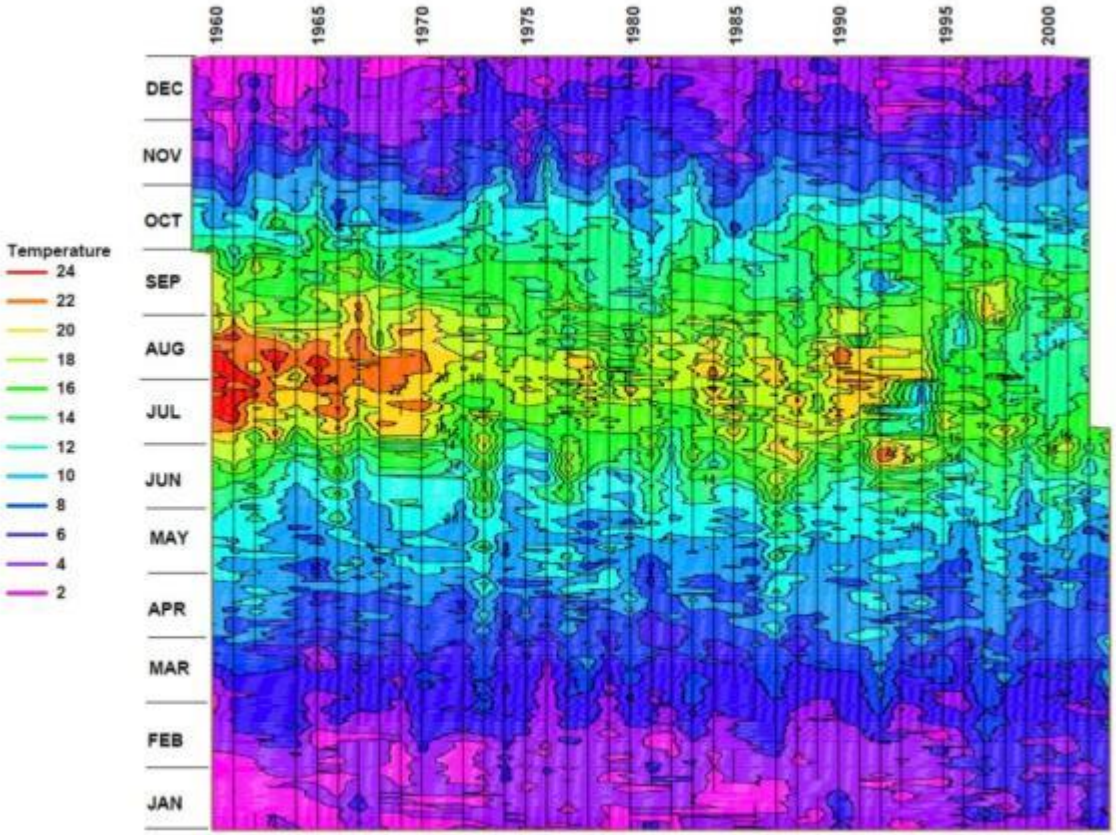
Begin date 2012-10-23

End date 2014-11-04

GO

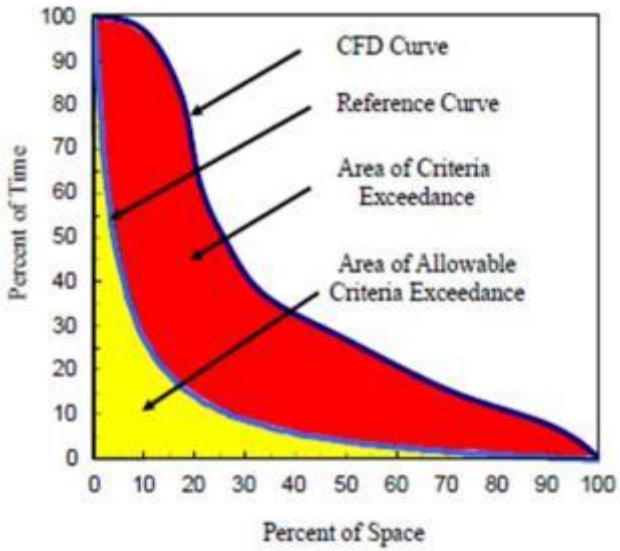
Summary of all available data for this site

Instantaneous-data availability statement

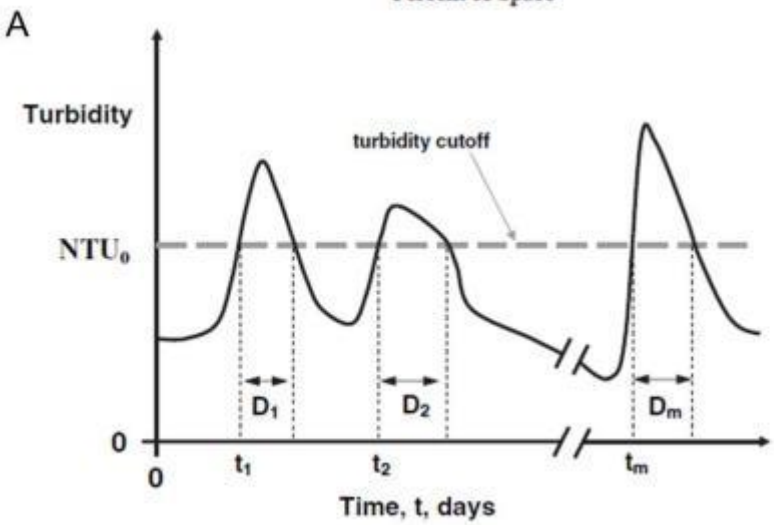


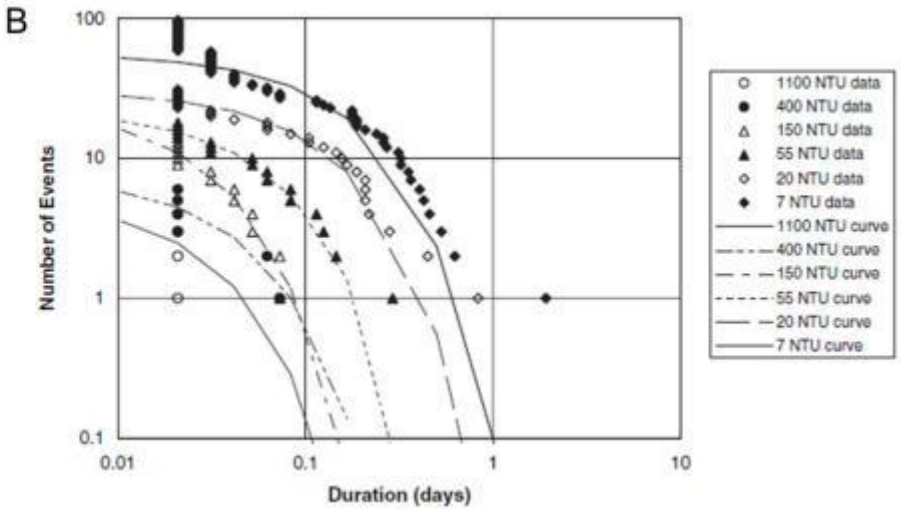
Daily mean water temperature in the Clearwater River at Spalding, 1959-2003

Example of a “Surface” plot generated in MS Excel, based on daily mean water temperature data from the Clearwater River at Spalding. Courtesy of Mike Schneider, ACOE, via Don Essig, IDEQ.



Cumulative Frequency Distribution (CFD) approach to Chesapeake Bay Water Quality Criteria Attainment Assessments (Figure 3 from Tango and Batiuk 2013).





CDFs can be used to evaluate the frequency and duration of events over turbidity levels of interest. (A) shows a hypothetical example of a turbidity criterion being exceeded over time and (B) shows an example of CDF curves that show the number of events during which turbidities exceeded various thresholds vs. duration and the corresponding exponential-fitted curves (Figure 2 and 3 from Schwartz et al. 2008).