



National Water Quality Monitoring Conference
Field Protocols Workshop
May 4, 2016

We've been soliciting and sharing 'lessons learned' from RMN partners along the way.

We're hoping that by sharing these, we can –

- **Reduce** the number of **avoidable mistakes**
- **Make data collection and processing easier and more efficient**
- **Improve the quality of data** being collected

The ensuing slides are a somewhat random collection of shared stories from our RMN partners to date.



Get to know your site, ideally before the installation

Evaluate the site during different flow conditions to help inform sensor placement. Take photos, seek feedback from more experienced personnel if needed.



Make sure your stilling well is tall enough, or consider adding a vented cap



Photo provided by John Ruiz (EPA)

“After a high flow event which overtopped our stilling well, we had a lot of sand and gravel go into the stilling well. This impacted around the data logger and we had a difficult time retrieving it to download the data and in one instance we had to pull up the entire stilling well and resurvey it as the data logger would not come out.”

Configure your sensor properly

This will make data processing easier and more efficient.

- At RMN sites, set the sensors up so that they start **recording on the hour (xx:00) or half hour (xx:30) or quarter hours (xx:15)**
- Use **consistent units** (e.g., always set to degrees Celsius)
- Multiple sensors at a site? Set them 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.
- Consider using **local standard time** (e.g., UTC-5 for sites in the Eastern Time zone) instead of daylight savings time. *Regardless of which you choose, when doing accuracy checks, make sure any discrete measurements taken are consistent with this setting.*

Make sure you understand how to launch your sensor

Some people deployed sensors but (accidentally & disappointedly) failed to launch them.



With some sensor software, there is a ‘status’ button you can click to verify that it is set properly.

Some organizations use the ‘**delayed launch**’ feature to configure the sensor to start recording measurements several hours after deployment (which allows time for the sensor measurements to stabilize).

Whatever the launch time, the exact time the sensor is correctly positioned should be recorded so that observations recorded before and after that time can later be removed during data processing.

Make sure you keep your sensor software updated

Some people were unable to download data because they hadn't updated their sensor software.



Make sure you “document” your site

One of the most **common reasons for the loss of sensors is failure to relocate** the sensor after initial field deployment.

Thus, **accurately georeferencing each sensor is critical** as is documenting sensor placement in a way that **enables field personnel to relocate the sensor during subsequent visits.**

16124, Flat Brook, Canaan
at Lower Barrack Rd
Lat: 41.945869039999998
Long: -73.319966039999997
Status: Swap
Probe # into stream: 118363b
Date/Time: 7/13/15 @ 10:55
Probe # Removed: 2238820
Date/Time: 7/13/15 @ 10:55

Crew Members: AM, BJ
Deployed Logger Information
Logger Type: HOB0 / Tidbit / Other
Pre-cal temp ck: _____ Date: 6/30/15
Pre-cal temp ck: _____
Download file location: S Drive
Sampling Interval Info:
Start Date & Time: 7/13/15 @ 16:00
Sampling Frequency: 1 Secs / Min / 1 Days
Deployment Type: Staked / Tethered
Free WT/Rock File: Angle Iron RR Photo /
Window Wt _____
Condition of Probe: Signs of Logger Drying out: Yes / No
Signs of Tampering: Yes / No
QA Temp Check 17.2°C Time 10:55 Probe / YSI

DESCRIPTION REGARDING PLACEMENT OF PROBE TO AID IN RETRIEVAL
Lower Barrack Rd, Hobo located ~15m upstream of bridge.
center of pool. U.S. of large, flat rock.

PLEASE SKETCH A MAP OF THE DEPLOYMENT AREA AS AN OVERHEAD VIEW
NOTE OBJECTS ON EACH BANK TO FORM A TRANSECT

File Information:
Data download date: _____ By: _____ File name/loc: _____
Post Calibration ck: _____ By: _____ File name/loc: _____

Pictures Taken: Yes / No # of: 3

A-3

Field form provided by CT DEEP

Documentation continued...



Photos provided by CT DEEP



Documentation continued...

Water Sensor (looking upstream)



Photos provided by VA DEQ

Deployment location (looking from upstream)



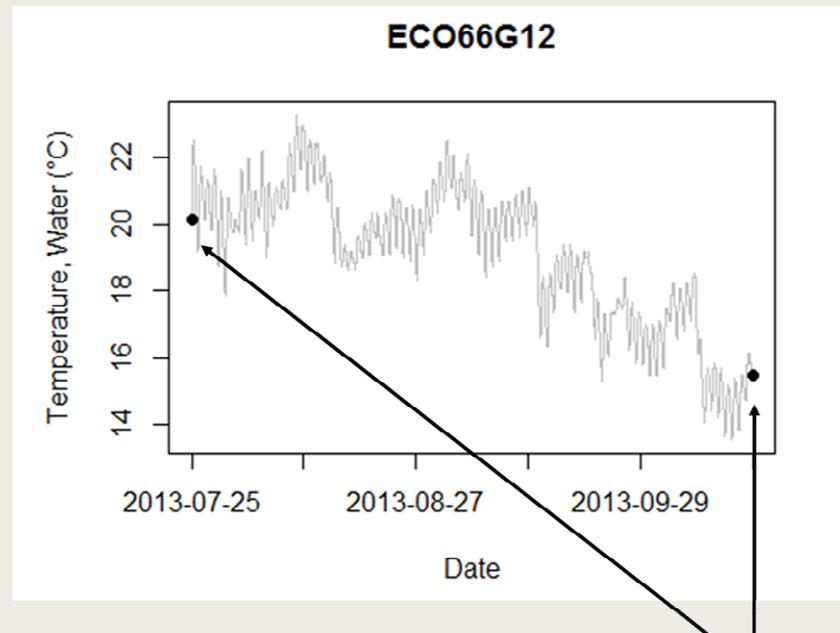
Deployment location (looking from downstream)



Take discrete measurements

Discrete measurements are single measurements taken during field visits that are compared to the closest continuous sensor measurement. They are used for –

- Accuracy checks
- Making corrections to your data (as needed)
- Validating your data (making them more defensible)



This example includes discrete measurements

Take good field notes

This is **essential** and should be done during **every site visit**.

Note **situations that could cause the sensor to record questionable readings** (e.g., sediment, dewatering, fouling, signs of vandalism)

Record the exact times of deployment and recovery.



Vandalism

Some people have lost sensors due to vandalism.

Some have had good luck putting labels with their contact information on their sensors.

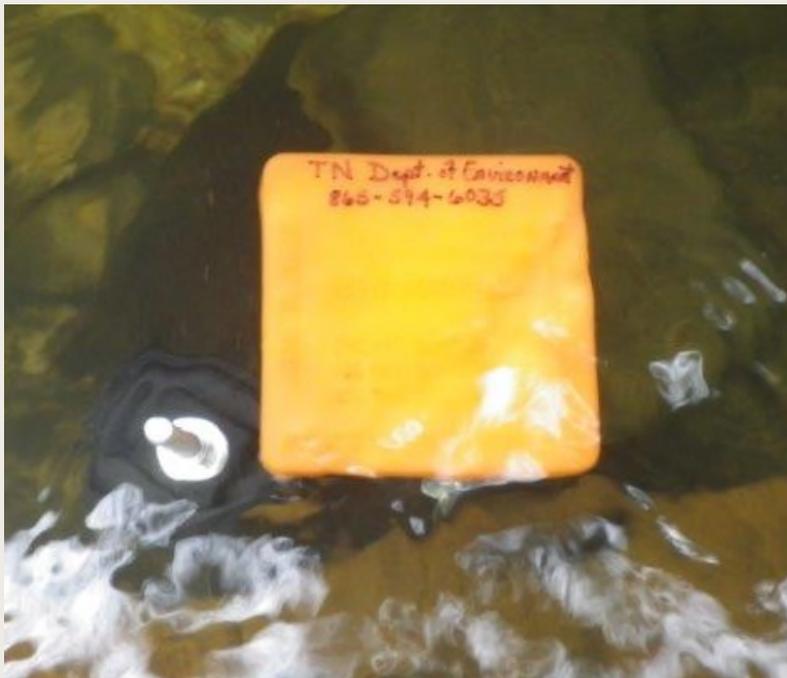


Photo provided by TN DEC

Unfortunately some vandals can't read...



Photo provided by WV DEP



Ice cover

Can negatively impact sensors (e.g., may cause some diaphragms to break, especially if the stream freezes completely for a prolonged period).

During periods of ice cover, some of your hydrologic data may be unusable.



March 2



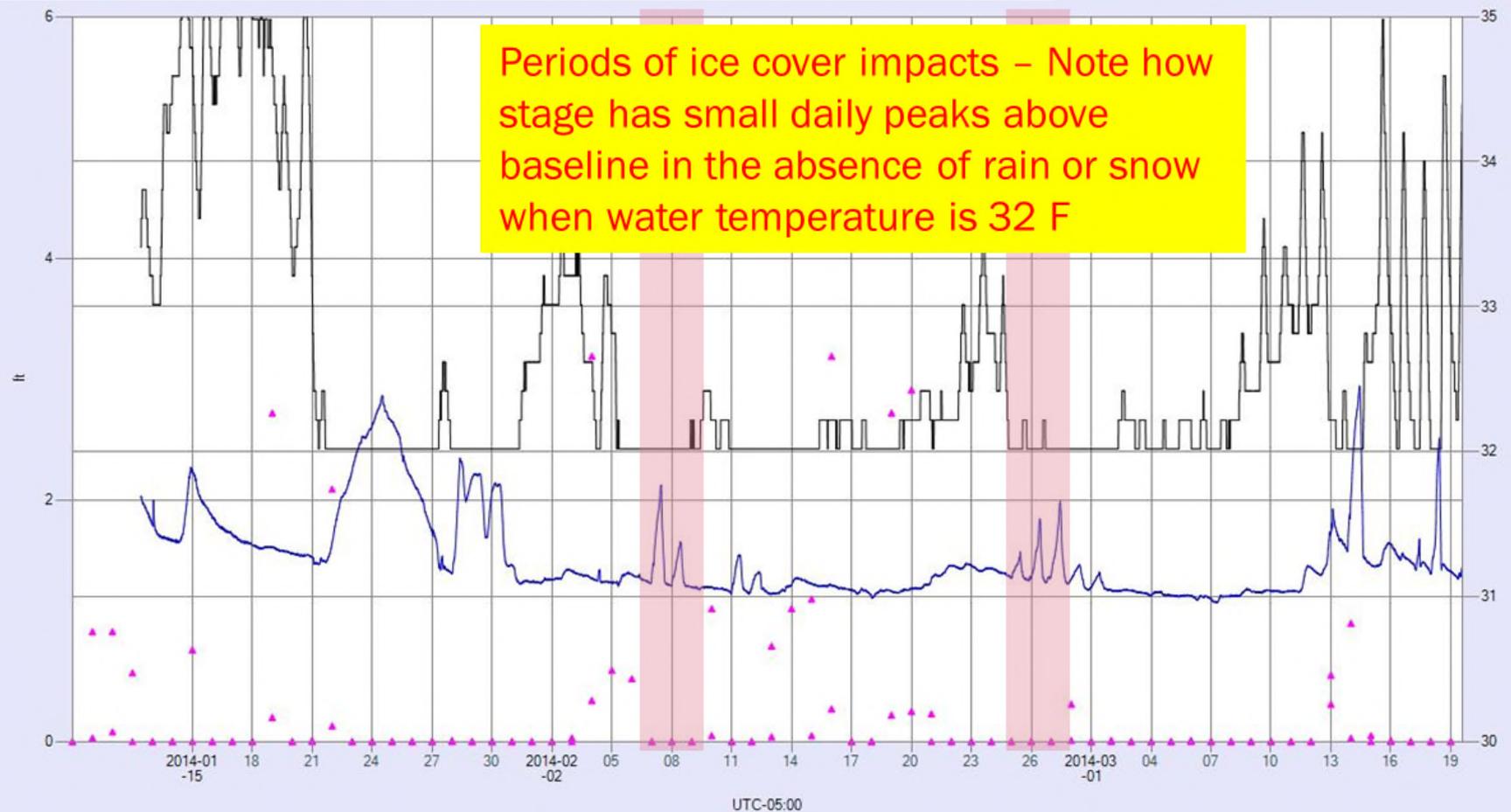
March 3



Ice cover 'signals' in the time series plot

Stage.20140319_20140915_MayBrook_Corrected.csv Sensor Depth, feet (LGR S/N: 10387389)

Blue = Water level (ft), Black = Temp (F),
Pink = rain/snow (in)



Beaver activity



7/30/15 - Arrived at site and observed that upstream beaver dam had washed out and was stuck in riffle/hydrologic control just downstream of gage

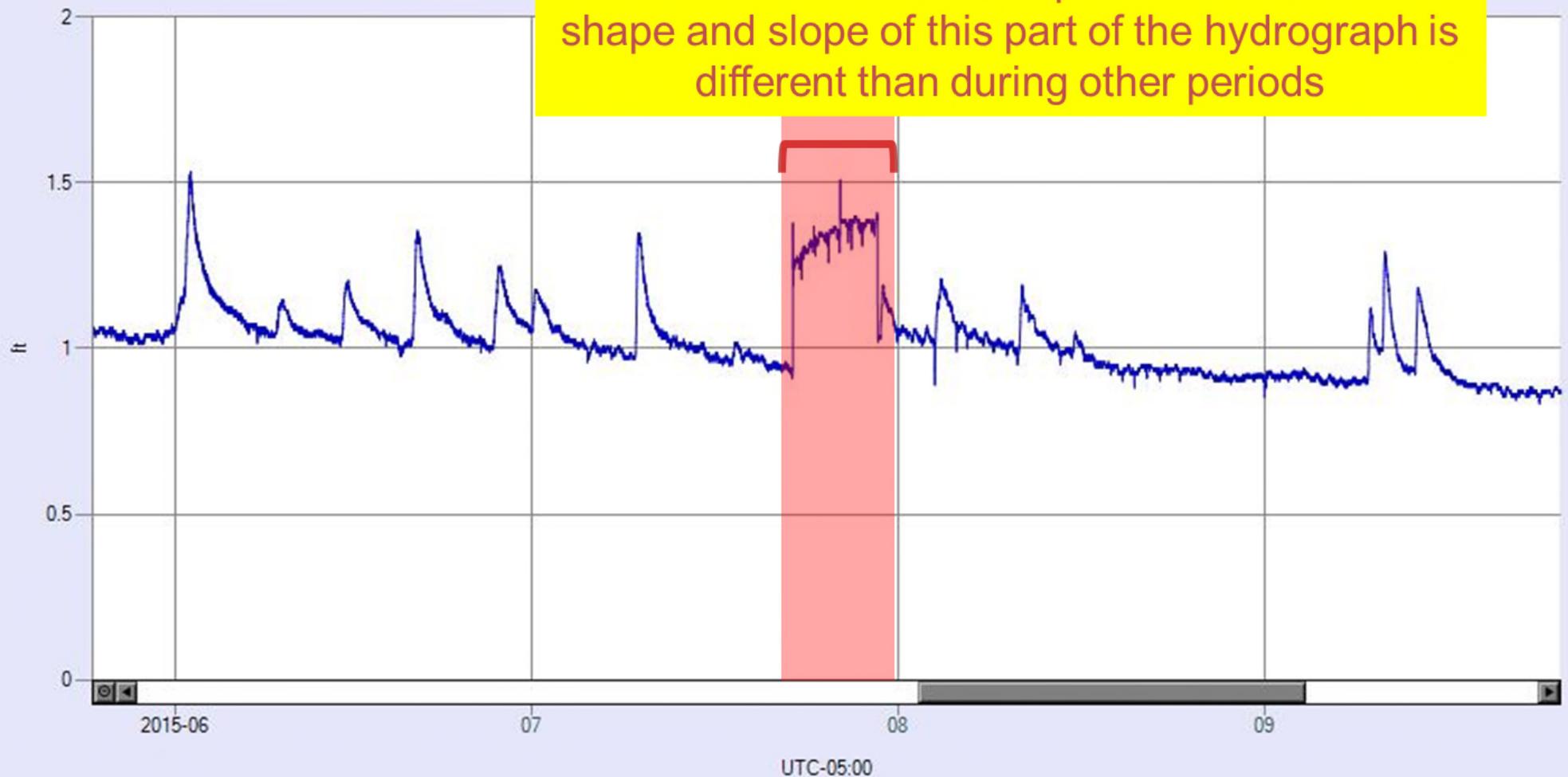


7/30/15 – After moving most of debris downstream (and out of hydrologic control), water level dropped 0.40 ft.

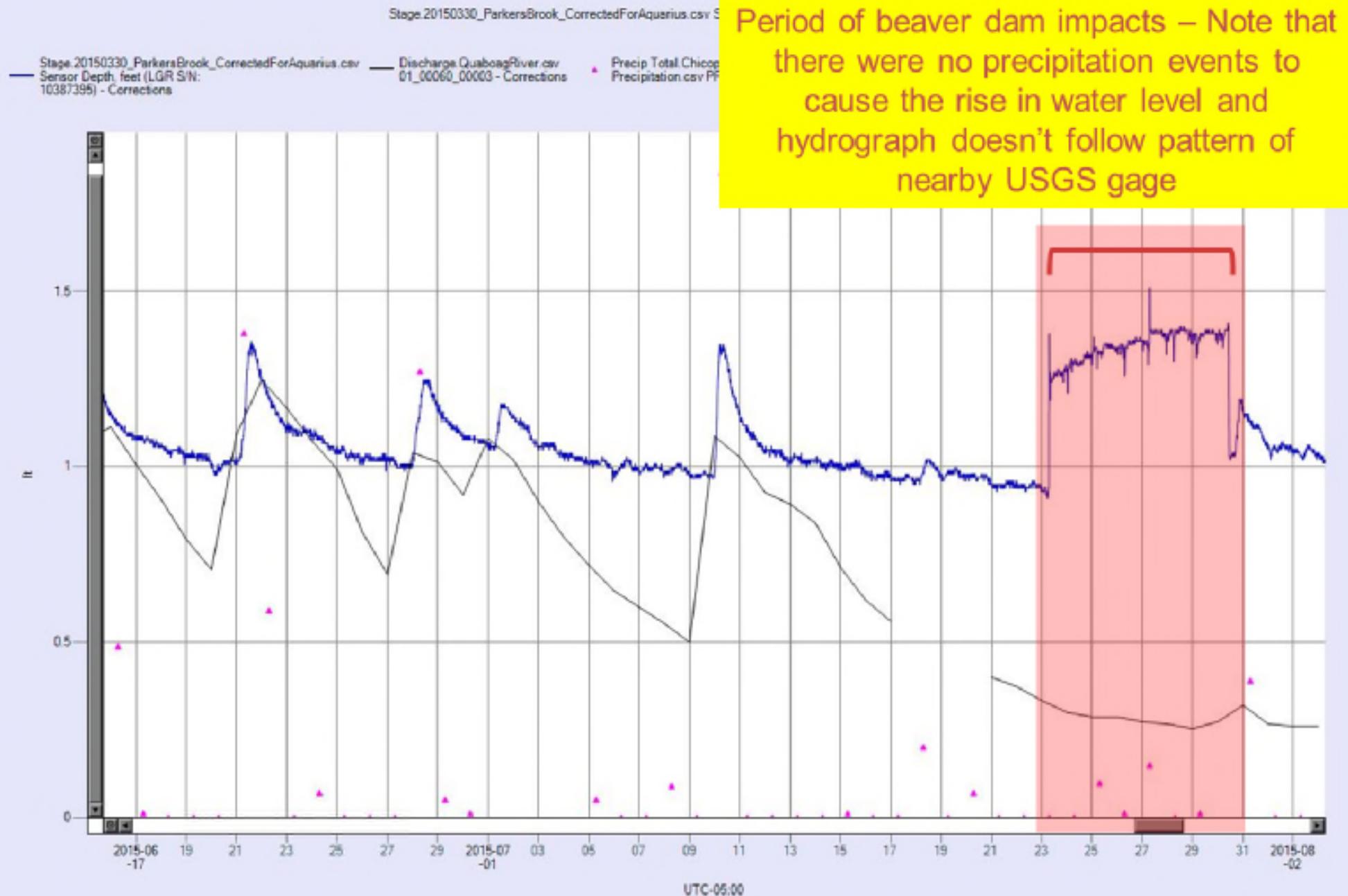
Beaver activity 'signals' in the time series plot

Stage.20150330_ParkersBrook_CorrectedForAquarius.csv Sensor Depth, feet (LGR S/N: 10387395)

Stage.20150330_ParkersBrook_CorrectedForAquarius.csv
Sensor Depth, feet (LGR S/N:
10387395) - Corrections



Beaver activity 'signals' in the time series plot



Leaf packs



Leaf packs 'signals' in the time series plot

Blue line = site with leaf impacts

Black line = nearby site, no leaf impacts



Equipment limitation?

Stage.20121025_20130925_BrownsBrook_Transducer Data.csv Feet

Stage.20121025_20130925_BrownsBrook_Transducer
Data.csv Feet - Corrections

