How I learned to enter data into AQS and learned to love(?) a QAPP

A tale of two PM 10 monitoring sites and the evaporating data.

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Evaluating the Tribal AQ Program Assembling a Plan to Revitalize

- Monitoring Sites
- Maintenance
- Data Management
- AQS

= QAPP

Evaluating the monitoring stations

- History : PLPT has monitored at two sites since 2003. Our involvement with TREX started in 2004. One site stopped sending data in 2005, the other in 2007
- Challenges:
  1. Get the communications working again,
  2. Getting the monitors running again.
  3. Updating a QAPP
  4. Managing the data
- Then there was the feared EPA AQS database to learn and try out.
- Turned out the AQS database entry was the easiest part of the puzzle.

Old equipment – new solutions

Then:

- Old equipment, old manuals, dead batteries, lack of records, etc. = Lost time, lost data

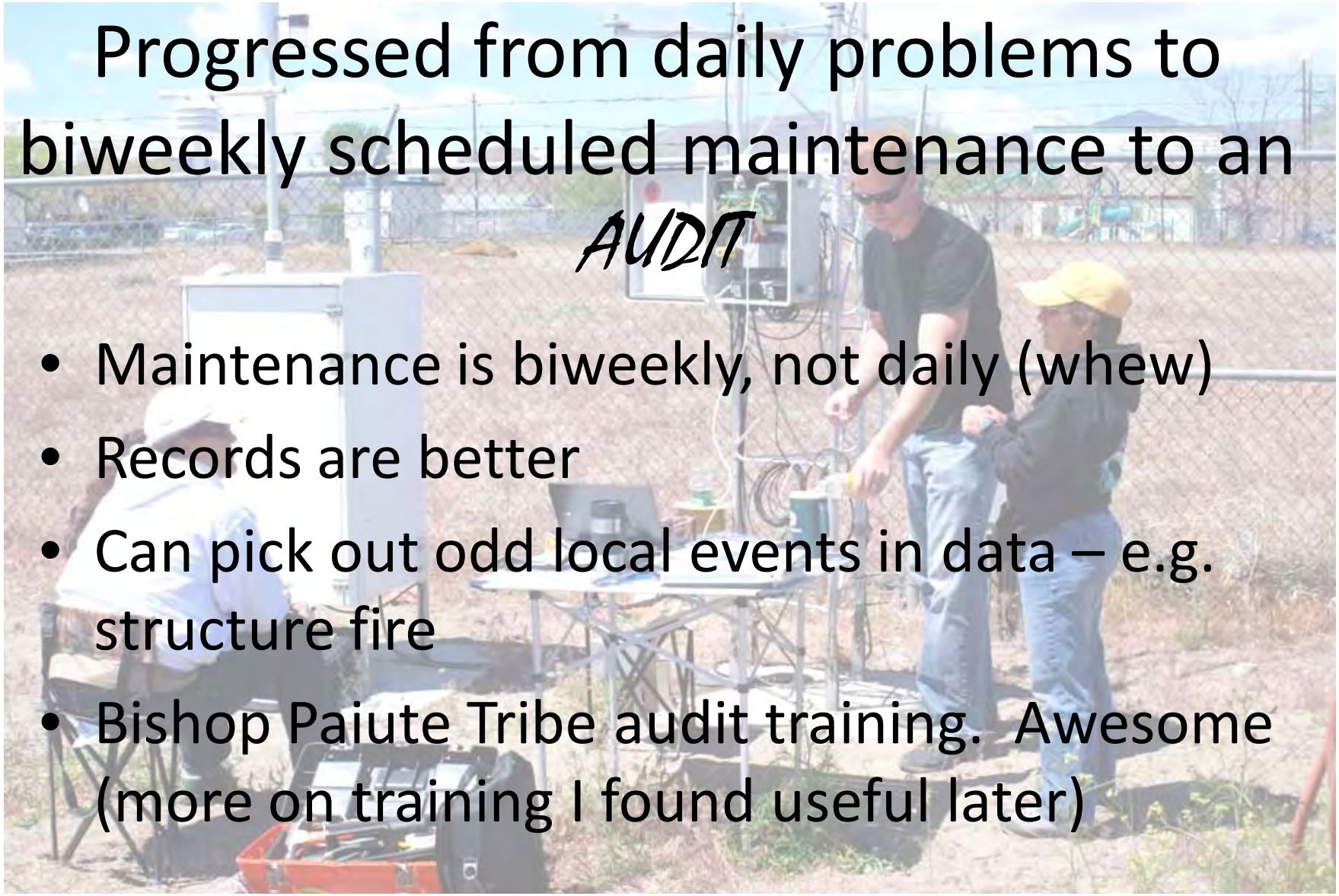
Now:

- New/refurbished equipment, updated firmware, manuals, SOPs.
- Replaced every battery.
- New site logs with QC
- Watch system like a hawk with a smart phone

Wadsworth

These are the people/groups who helped get things back on track

- EPA: Program Office, AQS team, QA Office
- ITEP: technical support esp. Glenn, Training, training, training
- Mark Sutherland of TREX – training, site evaluation, web issues
- Manufacturers' support desks
- Walker River PT grant management for TREX, Bishop PT audit training
- AQS Tribal conference calls



Progressed from daily problems to biweekly scheduled maintenance to an *AUDIT*

- Maintenance is biweekly, not daily (whew)
- Records are better
- Can pick out odd local events in data – e.g. structure fire
- Bishop Paiute Tribe audit training. Awesome (more on training I found useful later)

The Tribal Environmental eXchange network (TREX)

- Took me a year to figure out TREX is one of EPA's exchange network grants.
- There are between 8 and 15 tribes that have their data shared through TREX – air and/or water
- TREX and its parts help me a BUNCH

ITEP Data Management Summary

- Data needs to be collected – site logs
- It is nice if it is collected electronically so I don't have to download it all the time.
- It needs to be stored.
- It needs to be backed up.
- It needs to be validated. Needs software to help.
- It needs to be formatted for AQS and entered.
- It would be nice/critical if it showed up on a public web site

Red is what TREX does

ITEP's Data Toolbox does some of this too

QAPPs want to know the details of how you will do each thing.

TREX Data Flow

PLPT Flow of Data from Instruments to Main Storage and Backup Location for Raw Data and Validation

Figure 1 Met Tower

Figure 2 PM10 BAM

Figure 3 Datalogger - sends data every 15 minutes to radio

Figure 4 Signal to Radio on Tower

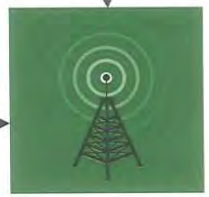


Figure 5 Signal from tower to Nixon Office

Figure 6 Nixon Server

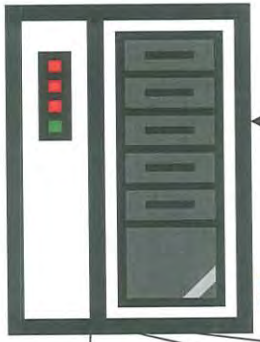


Figure 7 Northern Arizona University Server

Figure 8 AQ Laptop Computer

Data Acquisition, Storage, Backup

Validation Software AQS Formatting

Public Website

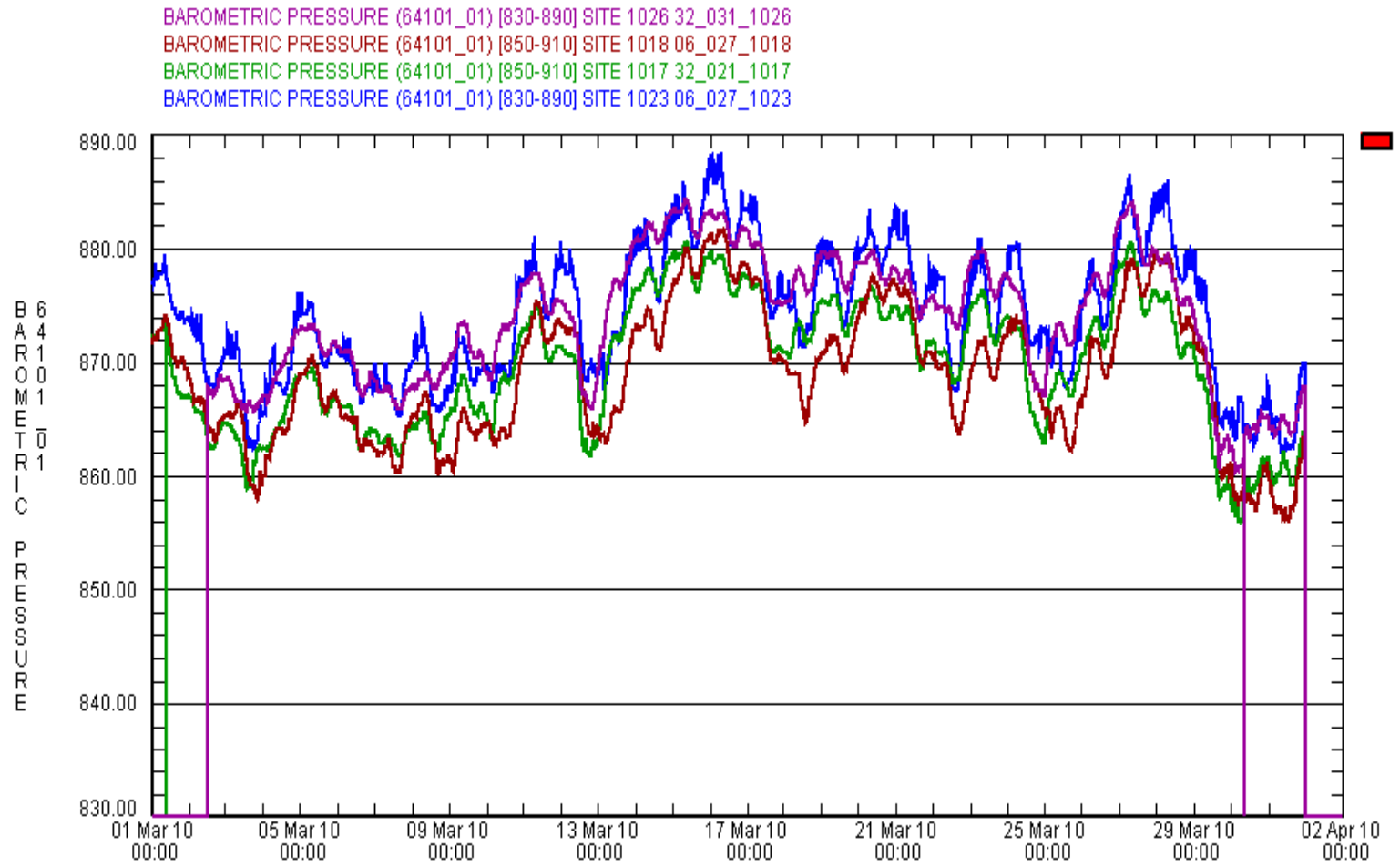
Data Collection/Storage/Backup at NAU

- Every 15 minutes, rain or shine, 5 minute values and hourly averages.
- The communications are set up on site and the data flows.
- Also extra backup on the data logger itself.
- There are reports to track it, check it, view it on the Public Website
- There are reports to check it, view it, validate it, format for AQS on the PW protected NAU site

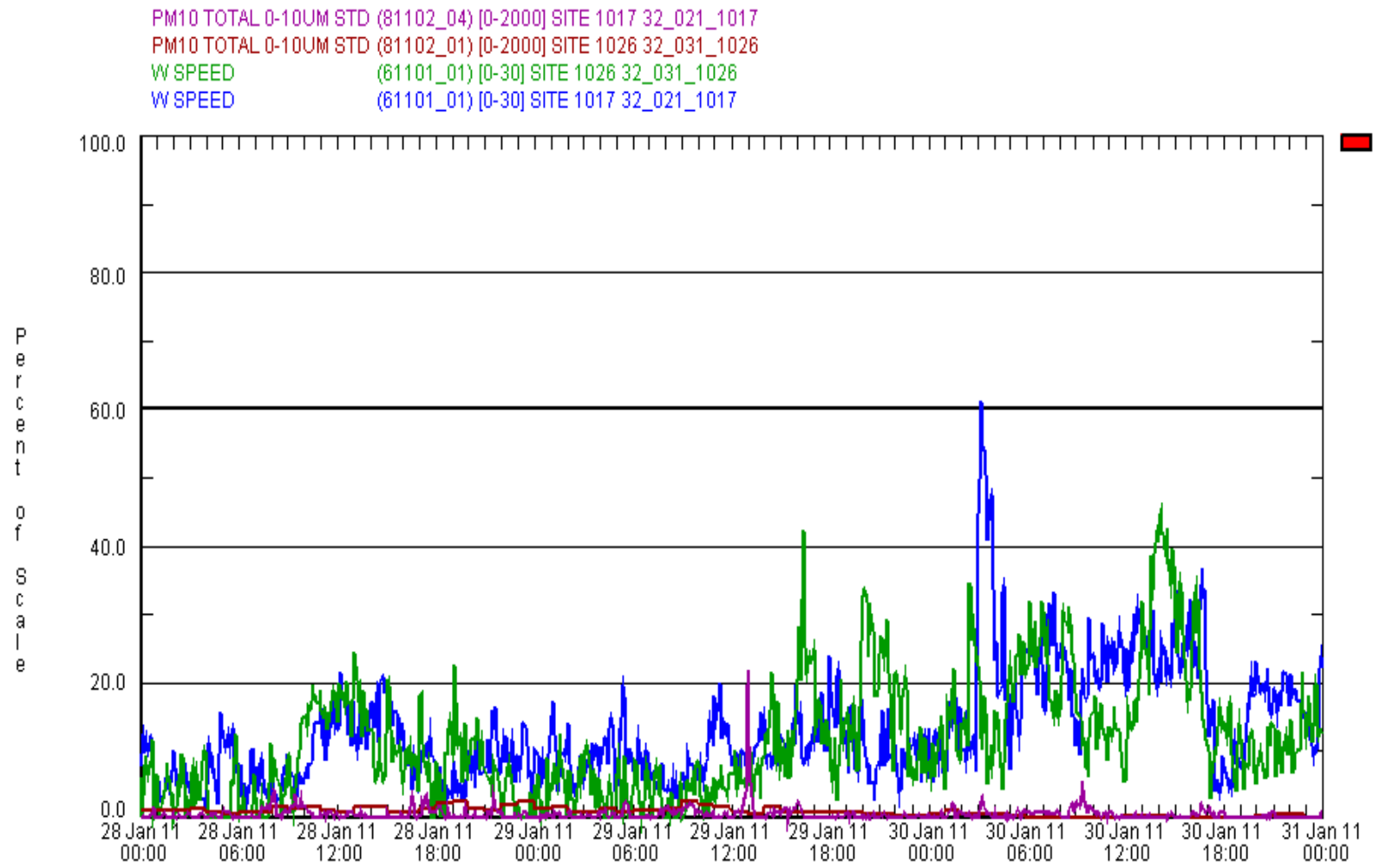
DATA Validation

- TREX has software (like ITEP's Toolbox) for graphical analysis.
- You can pick a tribal site near you for data comparison
- You can look at four parameters at a time for consistency
- You can flag the data and those flags will transfer to AQS

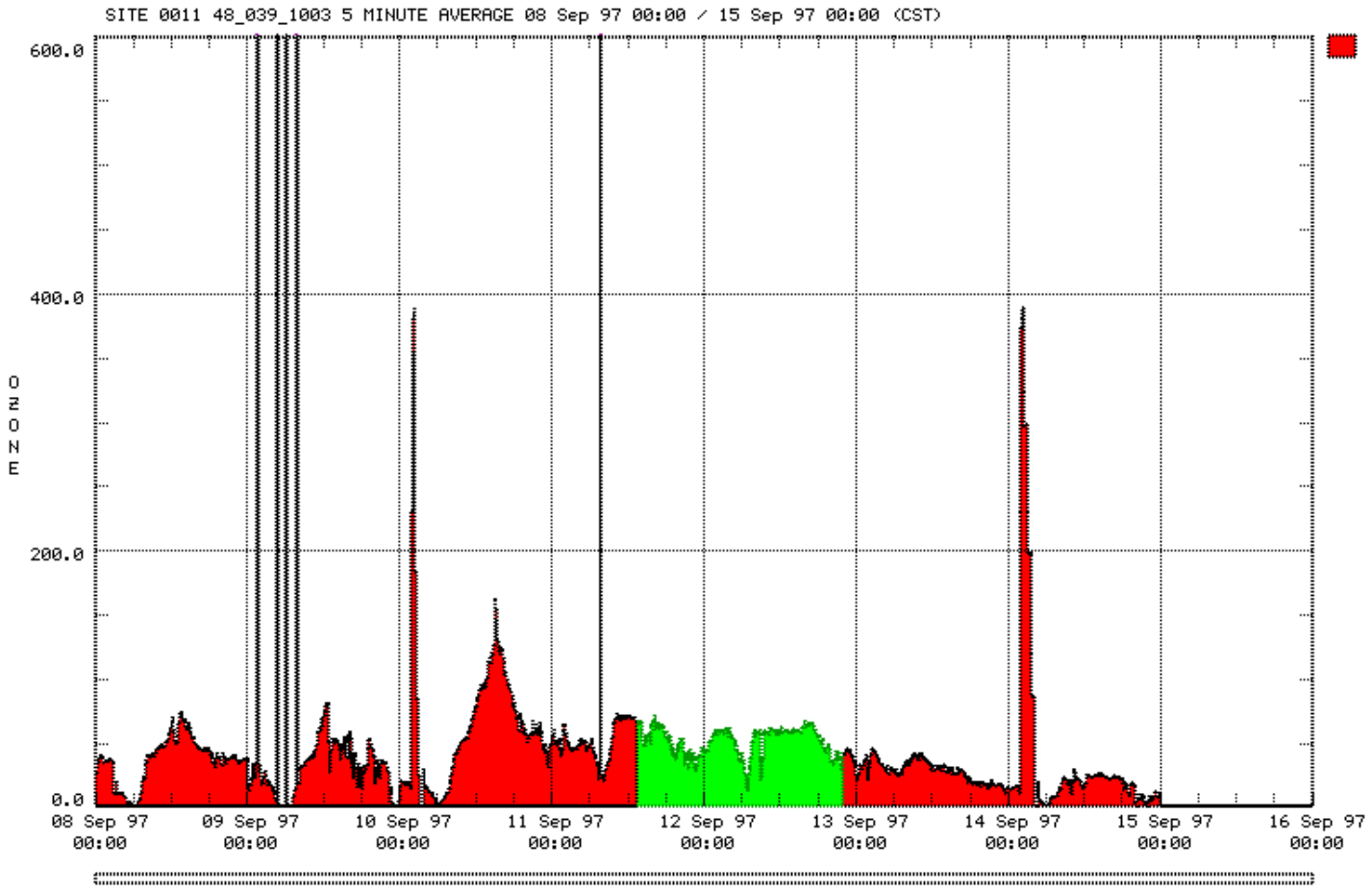
TREX Graphics:
compare 4 sites at once



TREX Graphics:
Comparison of two parameters at two sites



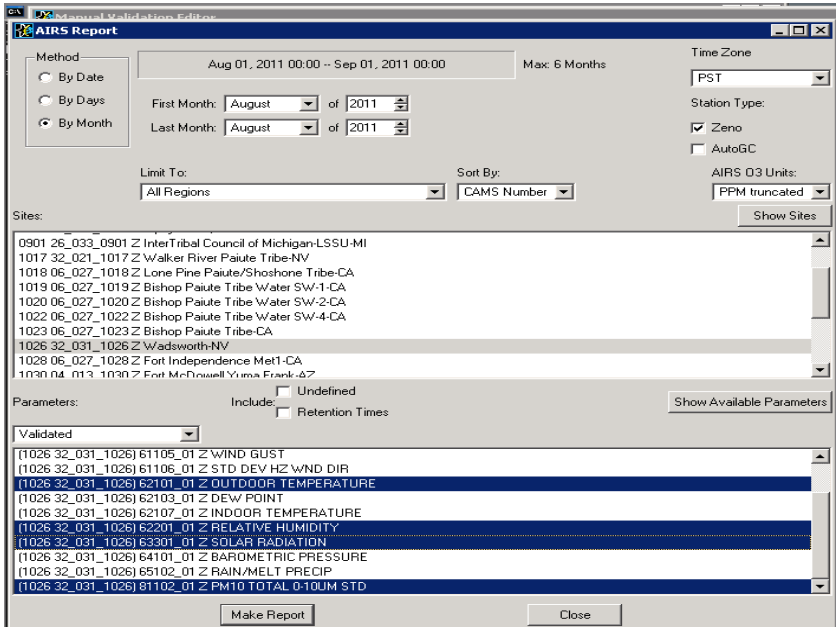
TREX: Make bigger and select a portion of data to change the flag

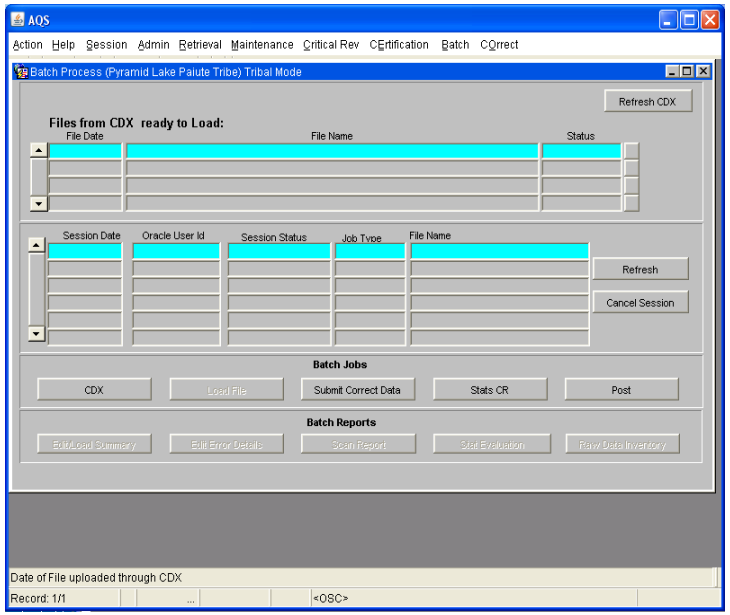


From Validation to AIRS/AQS

- Once the data is validated you can create an AIRS/AQS Report, store it to your computer, input it to CDX and to AQS.
- The format is AIRS, but CDX converts it the AQS's format.
- Once everything is set up correctly in AQS, *I have yet to get an error report from AQS.*
- **It is almost too easy.**

AQS Report – time/parameters, text file, CDX browse, AQS load



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13203110268510111001122100609160003 4 0017 0016 0018 0018 0023 0018 0016  I
13203110268510111001122100610000001 3 0015 0016 0013 0020 0020 0015 0016  I
13203110268510111001122100610160002 8 0027 0016 0016 0014 0013 0012 0011  I
13203110268510111001122100611000001 1 0008 0010 0012 0009 0008 0010 0012  I
13203110268510111001122100611080001 2 0013 0014 0014 0016 0021 0013 0011  I
13203110268510111001122100611160001 3 0017 0019 0018 0024 0014 0015 0015  I
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13203110268510111001122100613080001 0 0011 0012 0010 0009 0008 0013 0018  I
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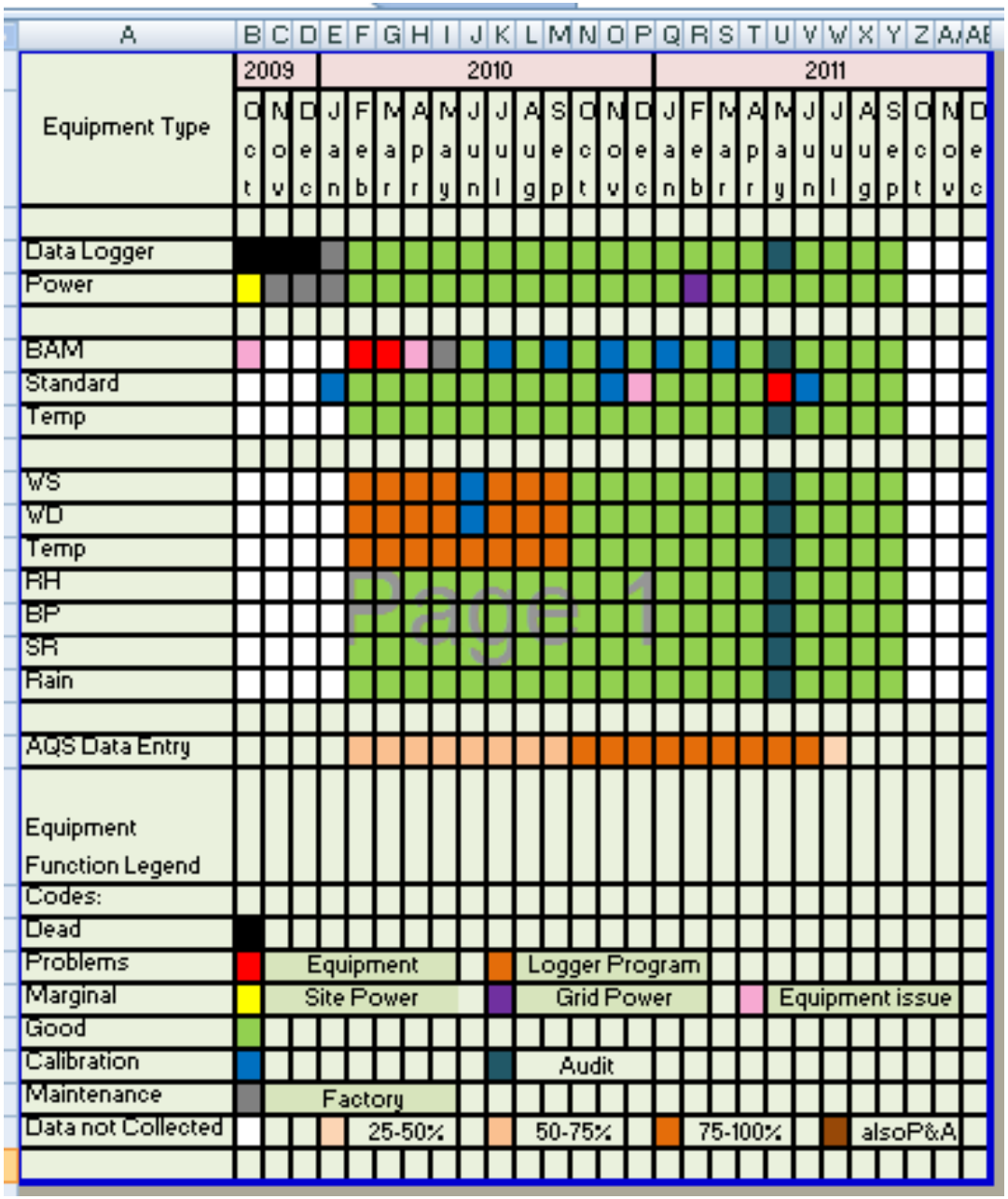
My three AQS errors

1. Site set up – Tom Lewis and Angie Shastas covered it on a Tribal call for Gila River. I did one site in the AQS class, did the other one on my own (all the info is or should have been in the QAPP)
2. Monitor set up – be sure to set up at least one monitor for your site. Otherwise it won't work.
3. Parameter codes and method code miss-matches

- Next: P&A – I haven't done it yet. PM 2.5 Primary Monitor

Site Status Chart



A QAPP too soon

I wrote a QAPP update to cover changes in people and getting the data into AQS.

I started with our old 2004 QAPP and used TURBO-QAPP to help figure out what was missing.

The data logger was dead so no data was flowing so I really didn't know some of the details.

The old QAPP was good for the sites and objectives.

It was not good on the data management.

So, my old QAPP didn't work, my update was still missing things

A QAPP too late

Now that I have figured out some of the data flow, I realize the QAPP was in a way too late and could have saved me a bunch of work.

When I get it approved, it will be a “succession planning” document that should describe for others who follow what needs documented, maintained, filed, and who will check to make sure the process is working (QC).

What's next

- Audit results show some really old equipment needs to go – on order
- Some more detailed/ more frequent calibration checks are needed – equipment on order to facilitate (can borrow from the TAMS center)
- New site
- New parameters – PM 2.5
- Policy type stuff
- More QAPPS(?) OMG

Summary

- From two non-working sites, we have one working well and one ready to move
- There is an SOP written for data validation
- All data for the one site is validated and entered into AQS through August 2011
- The site has been audited once
- Our QAPP is being updated for the data management and for PM2.5 and Met

Question?