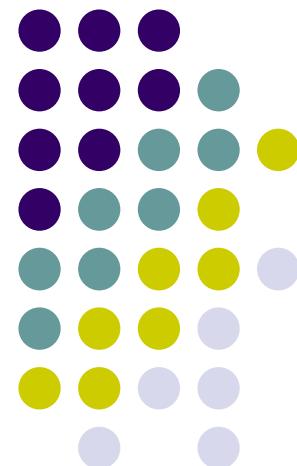


# Wisconsin's Exchange Network Experience

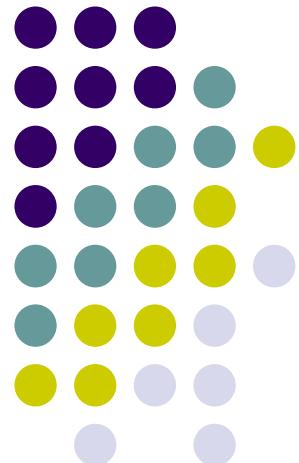
Using XML for AQS and AIRNow

Donalea Dinsmore



# What is the Exchange Network

- Partnership between states, tribes and EPA
  - includes other partners
- Agreed-upon data standards and communication protocols
  - Schema
  - Node
- Google: Exchange Network  
<http://www.exchangenetwork.net/>





# Implementing XML – Not Costly if...

- Node already exists with communication procedures
- Schema is fully developed
- Database captures required elements (or similar mechanism)

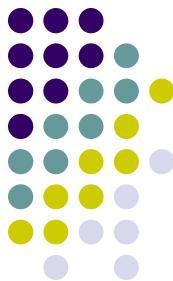
**AND**

You can navigate internal processes and communication

- Management approval
- Information Technology
- Finance
- Contracting

**OR** if you can take advantage of existing EN tools

# XML - Why Go There? Shameless Self Interest !!

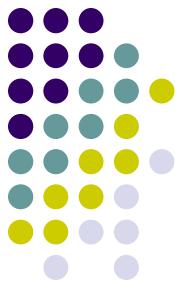


- Timing – Application software had to be rewritten
  - Export routines had to be fixed
  - Data qualifiers not implemented – adding manually
  - Opportunity to make enhancements
- **\$\$\$ - Grant goals matched our needs**
- Streamlining
  - Consolidated data flows – toxics and PM<sub>2.5</sub>
  - Redesign processes – fewer manual operations
  - Reduce time needed to process data
- **Big Picture Goals**
  - Using tools another program built – Enterprise Architecture
  - Data Sharing – Public Health Tracking – Cross-program

# Beginning Challenges - 2005



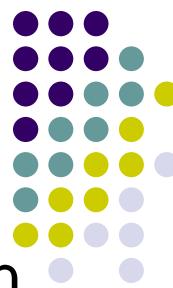
- Work group for AQS implementation
- WI - Data Gap too big for some transactions
  - Site and Monitor Missing Elements – delayed implementation
  - Implemented RD transactions to AQS
- AIRNow Node – timing
  - AirNow Node not ready before WI funding expired
    - WI missed the first wave with NJ
  - Challenge to schedule testing years later



# Bumps Along the Way

- Coordinating resources
  - Money
  - Developers - Contractors
  - AQS , AirNow, CDX – staff & credentials for testing
  - Staff time
  - Node Development
- Non-standard or Unique Implementation
  - AQS Headers are not allowed
  - Most validation occurs at AQS – different from other media – schema validates but fails in CDX
  - Immediate data transmission to AirNow

# Bumps – AIRNow (moving to production this week)



- Two years since NJ implemented – changes since then
- Requirements document misleading – cannot just send site latitude and longitude with RD transactions
  - Need full Basic Site transaction (AA) for lat. and long.
    - WI standard tables map to previous AQS list of GPS methods
    - Mechanism to deal with missing data elements – defaults
  - If send only RD, new sites are a problem
  - Reporting time of day (LST or UST) – AirNow needs to know

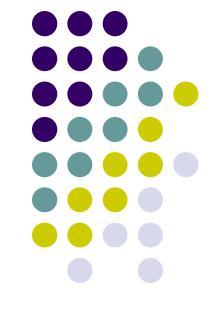
NJ : Reports to AIRNow with a time off-set – common in XML

```
<SampleCollectionStartTime>08:00:00-05:00</SampleCollectionStartTime>
```

WI: Why program in an off-set when time zone is reported?

```
<aqs:TimeZoneName>CENTRAL</aqs:TimeZoneName>
```

- No testing environment in AIRNow
- Don't support all PM<sub>2.5</sub> parameter codes
- All data stored as POC 1 in AIRNow



# Bumps Along the Way

- Messaging Not Fully Developed
  - CDX failures not descriptive enough
  - No Notice of File Arrival at AQS
- Who's Responsible?
  - Outages – Is it CDX or AQS? Who do you call?
  - Infrastructure Changes - DNR, CDX, AIRNow
    - Changes and system maintenance can disrupt data flow
- Schema – Versions change required elements
  - Affects validation – AIRNow in earlier version
  - May change what data tables need to be developed



# Outcomes beyond RD XML

- Streamlined transmittal process – same for AQS/AIRNow
- Automated functions to match field and lab data with integrity checks - Toxics and Particles
- Data turn around time cut by at least 50%
- New opportunities –
  - Data exchange with public health partners
  - Compatible tools like Mass Air –

***“Any of the Exchange Network Partners that are capable of generating air quality data in the AQS 2.0 XML format can reuse the Mass Air Infrastructure to kick-start their own interactive public web interface”***

# Outcome: Tracking AQS Submittal



Review Standard Observations Data - Windows Internet Explorer provided by Wisconsin DNR

http://protoasjava.dnr.wi.gov/wisards/browseStdObs.do

File Edit View Favorites Tools Help

Links Air Monitoring GIS Map (prod) AQS Production (iasint) using JRE ChemFinder.Com

EN - Air Quality System Review Standard Ob... Wisconsin DNR Air Mon...

Home Tools Reports Site Review Data Polling Reference Tables Sign Out

Welcome to WISARDS

Home -> Browse Standard Observations Table

Review Standard Observations Data

Add

Previous 1-17 of 17 Next Order Start Date Time asc Search

	Sequence No	Start Time	Value	Amount	Location	Param	Poc	Unit	Code	Method	Code	Field Id	Status	Reason	Airs	QAEPAR	Resend	Transfer Date	Time
<input type="checkbox"/>	20315186	2010-01-02 00:00:8			WAUK-CLEVELAND	81102	1	001	063		A8075606		Y	Y				2010-03-22 09:45:06.0	
<input type="checkbox"/>	20315185	2010-01-08 00:00:7			WAUK-CLEVELAND	81102	1	001	063		A8075607		Y	Y				2010-03-22 09:45:06.0	
<input type="checkbox"/>	20315184	2010-01-14 00:00:31			WAUK-CLEVELAND	81102	1	001	063		A8075609IN	112	Y	Y				2010-03-22 09:45:06.0	
<input type="checkbox"/>	20315183	2010-01-20 00:00:10			WAUK-CLEVELAND	81102	1	001	063		A8075610		Y	Y				2010-03-22 09:45:06.0	
<input type="checkbox"/>	20315181	2010-01-26 00:00:21			WAUK-CLEVELAND	81102	1	001	063		A8075613		Y	Y				2010-03-22 09:45:06.0	
<input type="checkbox"/>	20592809	2010-02-01 00:00:33			WAUK-CLEVELAND	81102	1	001	063		A8075614		Y						
<input type="checkbox"/>	20592813	2010-02-07 00:00:8			WAUK-CLEVELAND	81102	1	001	063		A8075618		Y						
<input type="checkbox"/>	20592819	2010-02-13 00:00:17			WAUK-CLEVELAND	81102	1	001	063		A8075624		Y						
<input type="checkbox"/>	20592820	2010-02-19 00:00:26			WAUK-CLEVELAND	81102	1	001	063		A8075626		Y						
<input type="checkbox"/>	20715326	2010-02-25 00:00:13			WAUK-CLEVELAND	81102	1	001	063		A8075629		Y						
<input type="checkbox"/>	20715340	2010-03-03 00:00:18			WAUK-CLEVELAND	81102	1	001	063		A8075633		Y						
<input type="checkbox"/>	20715330	2010-03-09 00:00:43			WAUK-CLEVELAND	81102	1	001	063		A8075639		Y						
<input type="checkbox"/>	20743258	2010-03-15 00:00:15			WAUK-CLEVELAND	81102	1	001	063		A8075642		Y						
<input type="checkbox"/>	20743261	2010-03-21 00:00:9			WAUK-CLEVELAND	81102	1	001	063		A8075646		Y						
<input type="checkbox"/>	20743264	2010-03-27 00:00:19			WAUK-CLEVELAND	81102	1	001	063		A8075651		Y						
<input type="checkbox"/>	20854152	2010-04-02 00:00:38			WAUK-CLEVELAND	81102	1	001	063		A8075793		Y						

# Outcome: Public Reports - QA



http://prodoasjava.dnr.wi.gov/wisards/webreports/generateAdvancedReports.do - Windows Internet Explorer...

**Wisconsin Department of Natural Resources**

## Air Quality Reports

### Advanced Reports

Please select the report type

Rolling Averages For Pollutant  QA'd Data Only  PDF  CSV

Please select the sort type

By Date

Please enter the start and end dates in mm/dd/yyyy format

04/01/2010  04/15/2010

Please select the pollutant

PM2.5 - 24hr

Please select a county and select site/sites within a county from the list below  
You can select multiple sites by holding the ctrl key while clicking on the sites of interest

All

All sites

APPLETON AAL - 550870009  
BAD RIVER TRIBAL SCHOOL - ODANAH - 550030010  
BAYSIDE - 550790085

Submit  Reset

These reports contain real-time continuous data that may not have been through a quality assurance review. Consider results as unofficial data. Data at individual monitoring stations may be influenced by exceptional events, instrument malfunctions or sampling errors. Examples of exceptional events include grass fires, scheduled burning, or windy and dusty conditions that influence PM 2.5 values for a relatively short time. Sampling errors may occur during routine maintenance if the instrument is disturbed or the measurement inadvertently includes readings from a calibration standard. For reports in the advanced reports menu, the data requests can get too big. If your query returns an error or will not display the page, try reducing the date range, number of parameters, or number of sites requested.



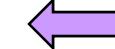


## Daily Average Report

PM2.5 daily 24 hour average for the period 02/14/2010 to 02/28/2010

Reporting Date: 05/21/2010

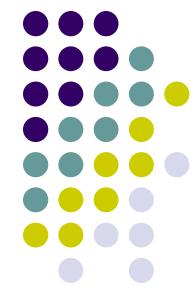
QA'd Data: True



### 090005 - GREEN BAY EAST HIGH

Date	Poc	Max	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
2010-02-14	3	7.1	7.1	7.1	7	7	7.1	7	7	6.9	6.8	6.5	6.3	6.2	6.3	6.2	6.1	6.1	6.1
2010-02-15	3	3.1	2.8	2.9	2.9	2.7	2.7	2.7	2.5	2.5	2.5	2.7	2.8	2.9	2.8	2.8	2.8	2.9	2.8
2010-02-16	3	3.2	3.2	3.1	3.1	3.2	3.1	3	3	3	3	3	2.9	2.8	2.8	2.8	2.8	2.7	2.8
2010-02-17	3	3.3	2.6	2.7	2.6	2.7	2.7	2.8	3	2.9	2.9	2.8	2.9	3	3.1	3.2	3.2	3.2	3.1
2010-02-18	3	5	3.4	3.3	3.4	3.2	3.2	3.2	3.1	3.1	3.2	3.3	3.3	3.3	3.3	3.4	3.5	3.5	3.5
2010-02-19	3	8.2	5	5	5	5	5.1	5.3	5.6	5.8	6	6.4	6.4	6.5	6.5	6.4	6.4	6.3	6.3
2010-02-20	3	17.4	8.7	9.2	9.8	10.3	10.7	11.2	11.4	11.8	12.3	12.9	13.4	14.1	14.7	15.1	15.4	15.9	16.2
2010-02-21	3	19.8	17.7	18	18.3	18.5	18.6	18.9	19.3	19.5	19.6	19.5	19.5	19.5	19.6	19.7	19.7	19.8	19.8
2010-02-22	3	16.2	16.2	15.5	14.7	14.1	13.4	12.5	11.6	10.8	10	9.2	8.4	7.8	7.1	6.6	6.1	5.7	5.5
2010-02-23	3	17.4	5.1	5.8	6.4	6.9	7.7	8.6	9.4	10.3	11.2	12.3	13.4	14.4	14.9	15.4	16.1	16.4	16.8
2010-02-24	3	16.8	16.8	16	15.3	14.7	14	13.1	12.3	11.3	10.3	9.3	8.3	7.3	6.7	6.2	5.6	5.1	4.6
2010-02-25	3	4.2	2.8	2.8	2.9	3	3.1	3.2	3.4	3.7	3.9	3.9	3.9	3.9	3.9	4	3.9	4	4
2010-02-26	3	4.2	4.2	4.1	4.1	3.9	3.8	4	3.9	3.8	3.5	3.4	3.3	3.3	3.3	3.4	3.3	3.3	3.2
2010-02-27	3	2.9	2.9	2.8	2.9	2.9	2.8	2.6	2.5	2.4	2.4	2.4	2.5	2.4	2.4	2.4	2.4	2.4	2.5





# Moving forward -

- WI – Adding transactions incrementally
- **Awaiting streamlined AQS loading process**
- Messaging for XML flow
- Fix disconnects in validation processes
- Continue to evaluate schema, standardize implementation – think cross media
- AIRNow – site data from AQS? Enhance error handling?



# Advice for getting started

- Don't be intimidated by the file size - ZIP
- Think beyond current processes – streamlining opportunities
- Leverage existing infrastructure – beyond air
- Find someone who can “talk IT”
- Check for existing Exchange Network grant
- Don't be afraid to ask “why?” and “why not?”