NCore – One Year Later

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SOUTHWEST OHIO AIR QUALITY AGENCY

Original location

Reasons for Original Site

- Historical data
  - Site had 30 years of data
  - Trace analyzers installed July 2006
- NOy comparison
  - Converter atop mast vs. converter back of unit
- Met Tower requirements
- Site met original criteria
- Regional Approval Received
- Realized site may not be permanent

NCore Site

Move required

- Original site not representative of urban population exposure
- Not downwind of city center
- OAQPS clarified met requirements

Late 2009, EPA request to move site

- Prepared new site plan
- Removed precursor analyzers & related equipment
  - Maintenance, annual servicing and training
- Contract required for HVAC system at new location – began June 2010
- Target date for equipment install at new site: October 1, 2010
- All equipment (HVAC system included) installed December 11, 2010

Site Parameters

- Collecting following parameters:
  - Trace Sulfur Dioxide
  - Trace Carbon Monoxide
  - Trace Total Reactive Nitrogen
  - Ozone
  - Nitrogen Dioxide
  - PM2.5, PM10, PMcoarse FRM
  - Chemical Speciation
  - Meteorological Data
  - BAM FEM
  - Lead

Challenges with Trace Level Equipment

- Staffing
- Equipment
- QA/QC
- Data Collection
- Data Review & Reporting

Challenges - Staffing

- Turnover
- Training
  - Operations of Equipment
  - Calibrations
  - Annual Servicing of Equipment
  - Data Management
- **Full time** dedicated staff member required
  - Learn complexities of equipment
  - Learn data validity of real time data

Challenges - Equipment

- Calibrations
  - Mass Flow Controller Checks
- Method Detection Limits
- Vendor Assistance
- Sensitivity to Temperature & Humidity
  - Small amount of drift leads to frequent adjustments
  - Independent HVAC System
- Learning nuances of equipment
  - Periodic maintenance vs. Annual Servicing

Challenges - QA/QC

- Calibrations
  - Mass Flow Controller Checks
  - What level do we calibrate?
- Zero/Span Check
- Precision Checks
  - New procedure = new form
- Method Detection Limits
- Audits
  - What levels do we audit?
  - Low level
    - Know how to perform, challenge was low level
      - Acquiring equipment and gas cylinder for dilution key

Challenges – Data Collection

- Different data acquisition software
  - Benefits of New Software
  - Drawbacks of New Software
- Communication between trace equipment and original data acquisition software
  - Benefits of Original Software
  - Drawbacks of Original Software

Challenges - Data Review & Reporting

- Level 1 data review & processing significant increase
  - More Shortfalls & editing due to increased QC
- Data processing & formatting
- NCore has doubled continuous parameters for review
  - Leads to larger data file and increased data validation

Challenges Overcome

- Careful review of Technical Assistance Document critical to developing program
- Back-up Staff
- Working closely with Ohio EPA to develop audit procedures
- Individual equipment diagnostics

Individual Equipment Diagnostics

- CO/CO_2 converter efficiency
- SO_2 UV lamp intensity
- NO_y converter efficiency

Ongoing Challenges

- Span Check vs. Precision Check
  - How many cylinders do we purchase
    - Regulators, plumbing, etc
- Clarification of CFR language
  - Zero/Span, Calibration, Audit Ranges

Audit Performance

Has audit performance improved?

- No

CO Audits

	Level	Actual (ppm)	Indicated (ppm)	% diff	Absolute Average
3/29/2011	4	2.0	2.1	4.8	2.6
	5	5.5	5.7	3.3	
	6	12.4	12.3	-0.2	
7/5/2011	4	2.00	1.75	-11.90	10.3
	5	5.62	5.09	-9.40	
	6	12.26	11.07	-9.70	

NOy audits

	Level	Actual (ppb)	Indicated (ppb)	% diff	Absolute Average
5/10/2011	5	27.6	25.2	-8.7	4.1
	6	65.7	64.7	-1.5	
	7	156.8	160.0	2.0	
8/2/2011	5	29.7	27.7	-7.7	5.0
	6	66.9	68.5	2.4	
	7	160.4	169.9	-5.9	

SO2 Audits

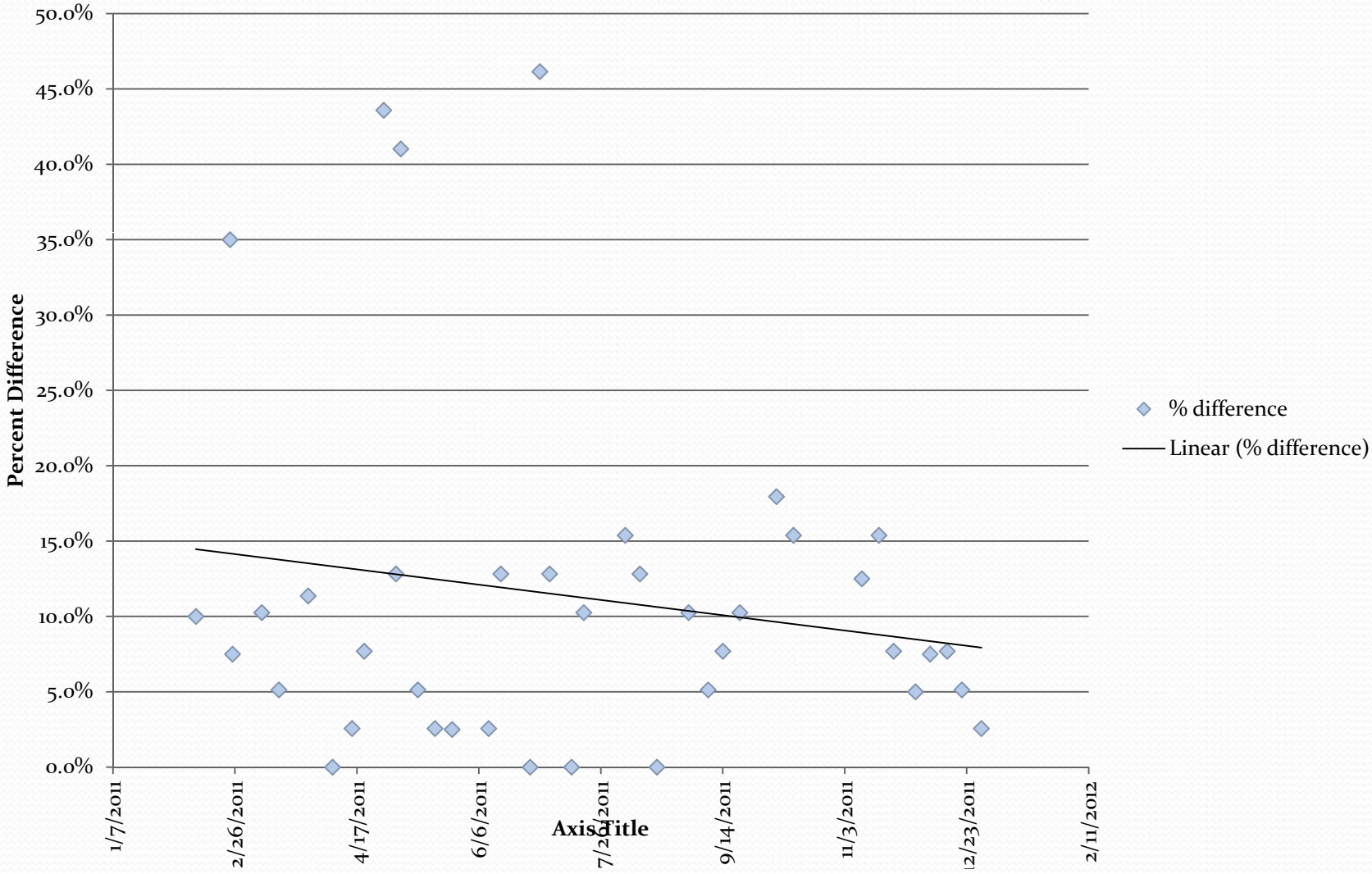
	Level	Actual (ppb)	Indicated (ppb)	% diff	Absolute Average
6/2/2011	3	7.69	7.62	-0.91	3.48
	4	15.65	16.73	6.90	
	5	28.18	28.92	2.63	
11/15/2011	5	33.0	36.2	9.9	11.0
	6	77.0	86.9	12.9	
	7	133.8	147.0	9.9	

Precision data

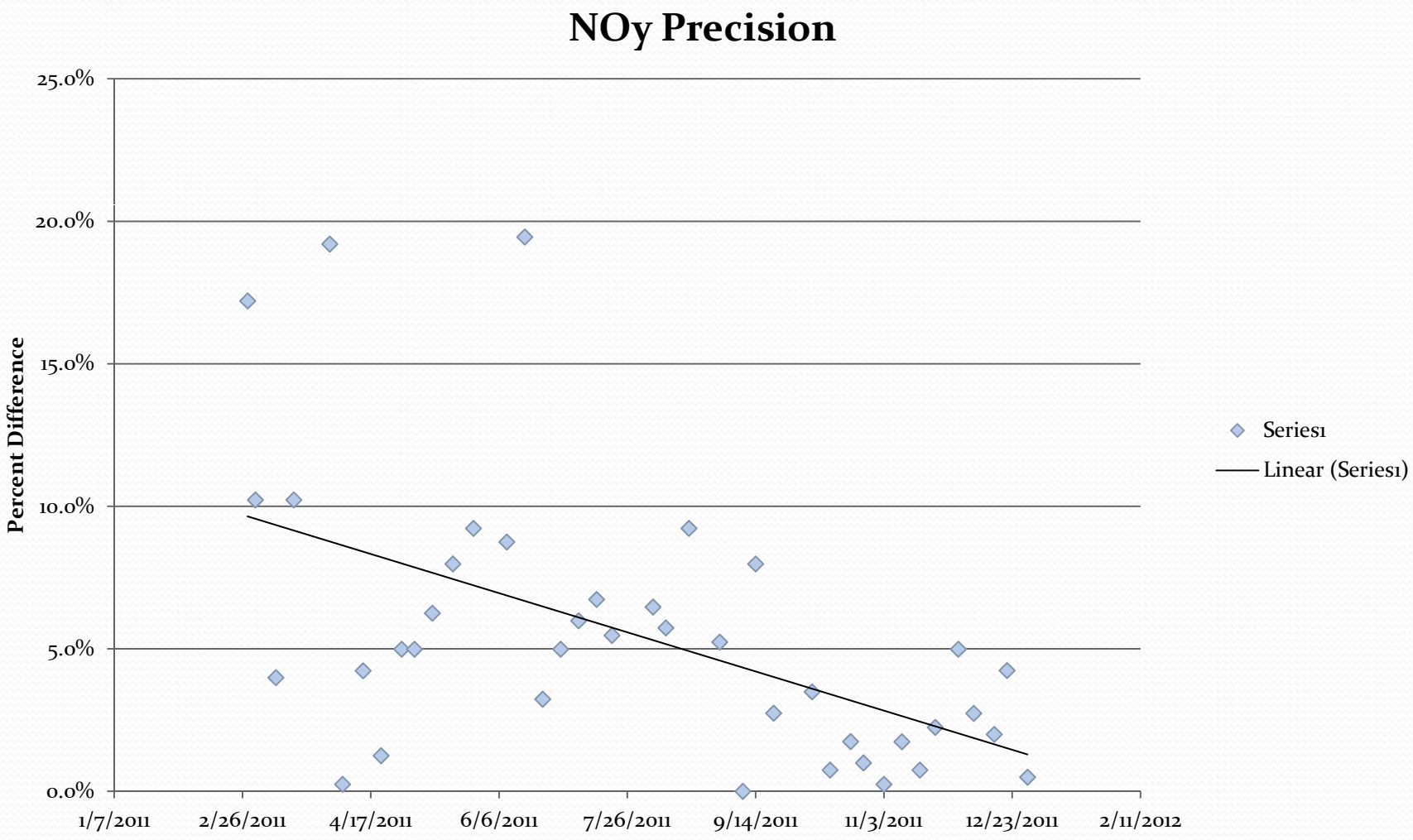
Has Precision Data Improved?

- Yes and No

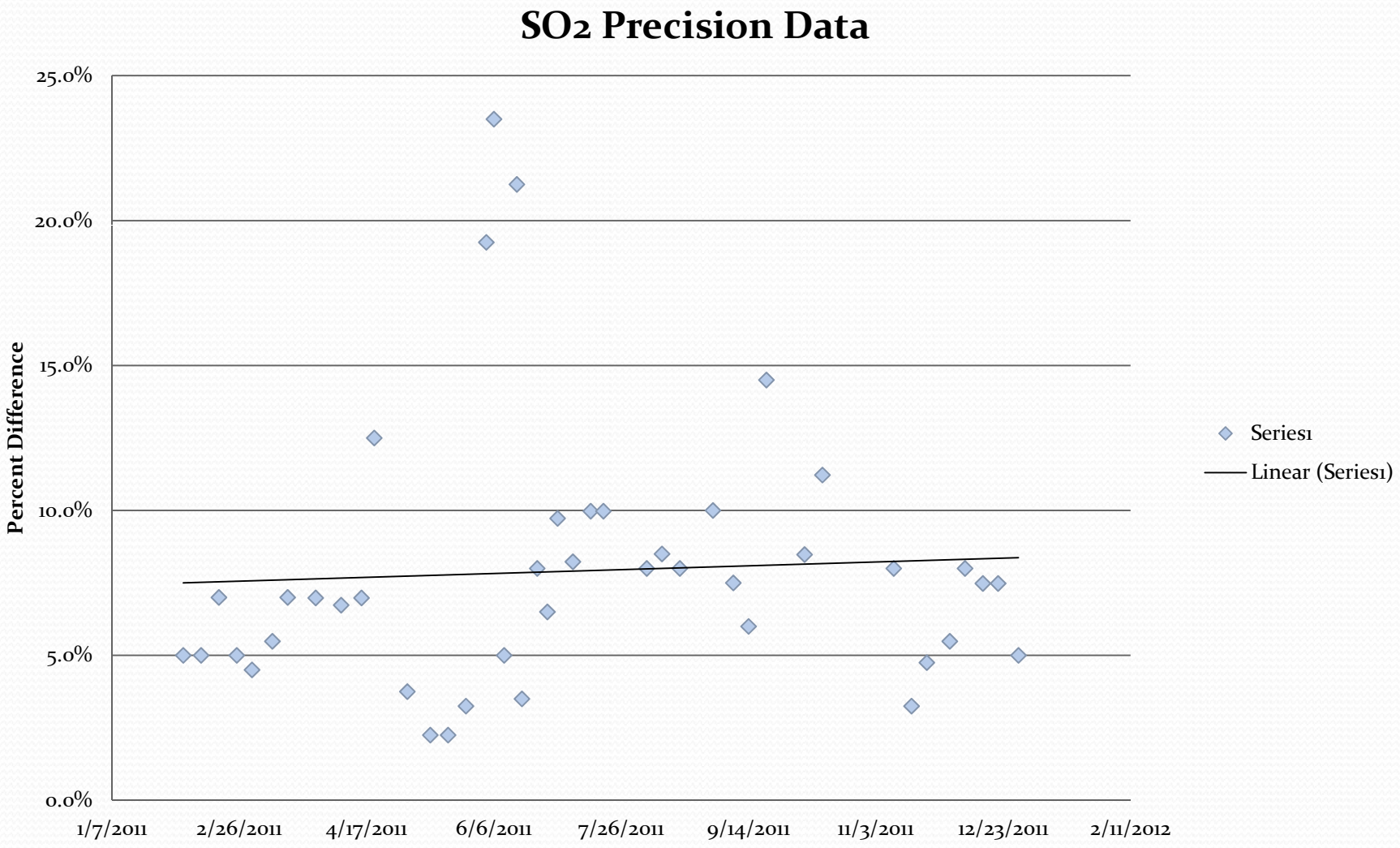
CO Precision data – 2011



NOy Precision Data



SO2 Precision Data



Future Challenges

- Data analysis to determine patterns
  - Staff time needed
- Keeping experienced staff
  - Develop SOPs for training
- Determining Method Detection Limits
  - Time and understanding
  - Budget
  - Equipment
  - Space in monitoring area

Lessons Learned

- Challenges and solutions are evolving with new program
- Install and operate equipment at least 6 months in advance to avoid data loss
- Develop equipment and/or Ncore work groups to work out equipment issues
- Wait for funding, guidance, site approval before moving forward
- Start with new equipment – as much as you can

Monitoring & Analysis Group

Thank you!

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