Agenda No. 9

PERSONAL AND COMMUNITY BASED MONITORING

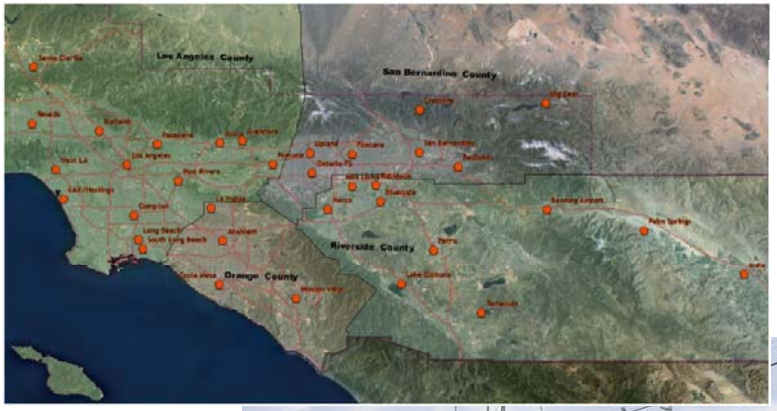
Governing Board Retreat
May 15-16, 2014

Matt Miyasato, Ph.D.
Science & Technology Advancement

Cleaning the Air That We Breathe…

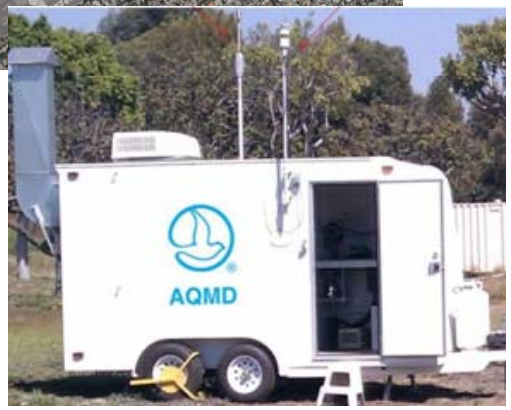
Traditional Air Monitoring

- Permanent, large, fixed sites
- Address NAAQS
- Comply with all CFR specs
- Sophisticated and highly accurate
- Expensive



Community-Based Air Monitoring

- Local concerns and issues
  - Resident complaints
  - Perceived health impacts
  - Requests from other agencies, elected officials, etc.
- Often source-specific
  - Special monitoring studies
  - Different approaches for different situations
- Non-regulatory
- Technologies deployed
  - Monitoring trailers
  - Deposition plates
  - Portable monitors
  - Grab samples
- Enlist the help of residents
- Risk communication



Monitoring By Community Groups / Others

- Current efforts in South Coast
  - Community based health studies
  - Measurements conducted by
    - *University researchers*
    - *Local agencies*
    - *Consultants*
    - *Single Individuals (DIYers)*
    - *A combination of the above*

- Technology used
  - Portable monitors
    - *Non-FRM/FEM but quite reliable*
  - Low cost air quality sensors
    - *Non-FRM/FEM; unknown performance*
    - *Uncertain data quality*

CCAEJ

Center for Community Action and Environmental Justice

LACEEN

L.A. Community Environmental Enforcement Network

SOUTHERN CALIFORNIA ENVIRONMENTAL HEALTH SCIENCES CENTER

Low Cost Sensor Technology

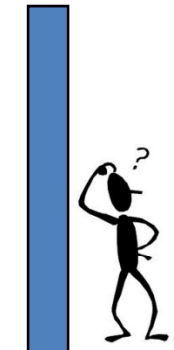
- Only a few
- Single pollutant measurements
- Non-FRM/FEM

SENSOR PERFORMANCE

- Many (and more to come)
- Single and multi-pollutant measurements

Decent

Moderate cost ($8K – 10K)



Unknown

Lower cost ($0.5K – 10K)

Low Cost Sensor Technology

- Air monitoring sensor information and data already available on the web

http://www.citi-sense.eu

http://www.myairbase.com

http://airqualityegg.com

Low Cost Sensor Technology

Potential concerns

- Rapid proliferation
- Data quality not on par with that of FRM and FEM instruments
- Potential "overload" in the amount of non-agency air monitoring data
- Technical Issues
  - -Calibration, accuracy, interferences, time averaging, longevity, expertise of user
- Data interpretation
  - -Which pollutant?
  - -What levels?
  - -False positives: unwarranted alarm
  - -False negatives: false sense of security
- Confusion

Opportunities

- Low cost
- Relatively small size
- Ease of operation
- Broader community participation and awareness
- Wider spatial and temporal distribution
  - -More refined control strategy
  - -Early warning/community alert system
- Data available on web, smart-phones, etc.

Low Cost Sensor Technology

- Limited European and US EPA efforts to gather information, encourage use, and engage the public

- No State or Federal program to systematically evaluate sensor performance in the US

Potential Path Forward

- Engagement, Education and Communication are essential
- CAPCOA Conferences
- <u>What can SCAQMD do?</u>
  - Opportunity to provide leadership
  - Utilize SCAQMD staff experience and expertise
  - Establish testing center

SCAQMD
Air Quality Sensor Performance Evaluation Center
"AQ-SPEC"

"AQ-SPEC" Concept
Potential Framework

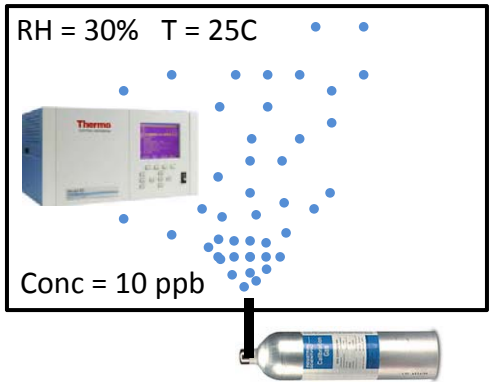
FIELD TESTING

(Side-by-side comparison w/ FRMs)

VS

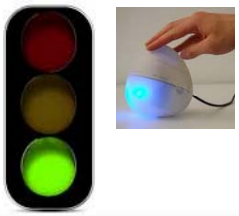
LAB TESTING

(Controlled conditions)

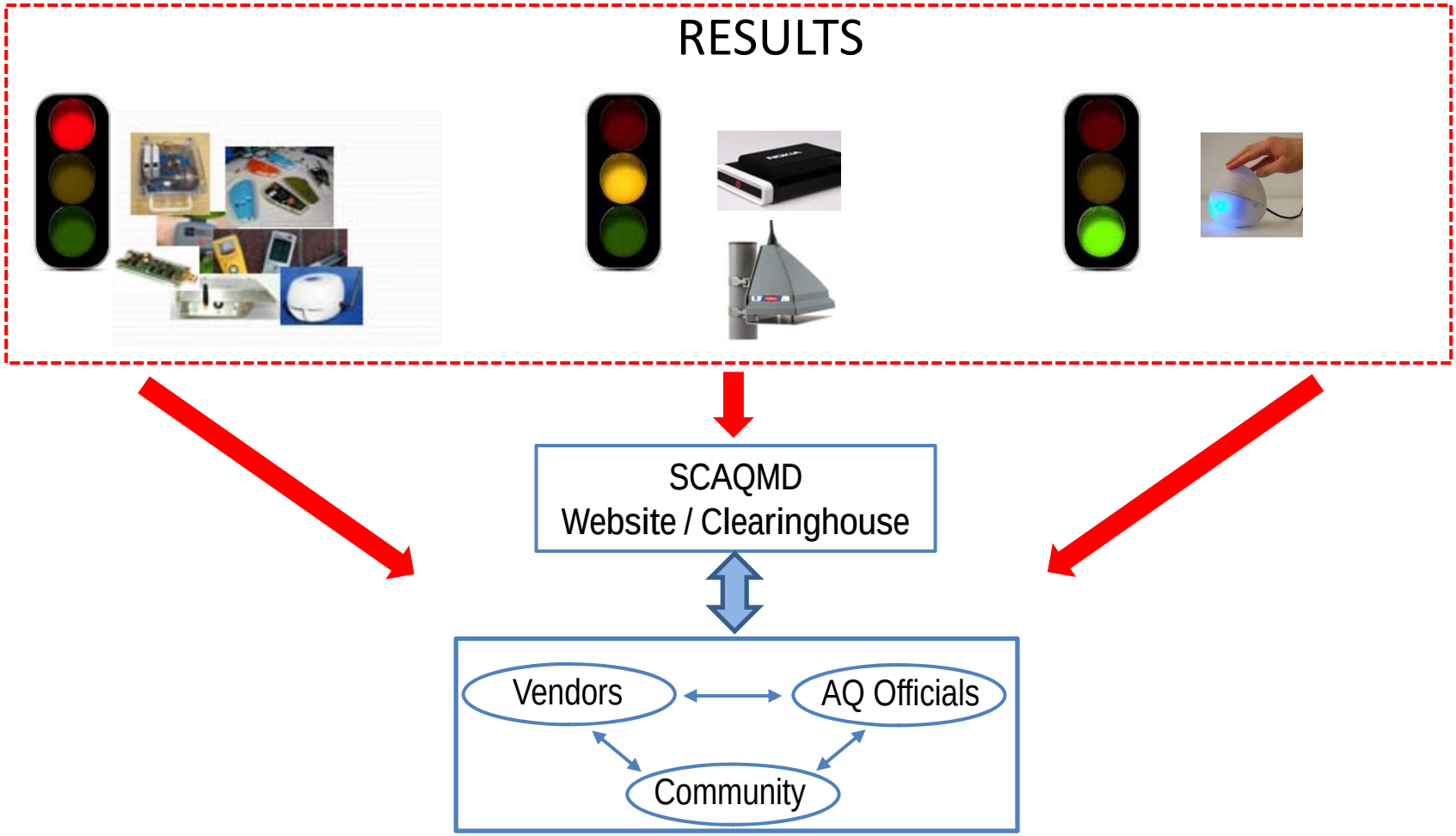


RESULTS

(Categorize sensors based on performance)



"AQ-SPEC" Concept
Potential Framework



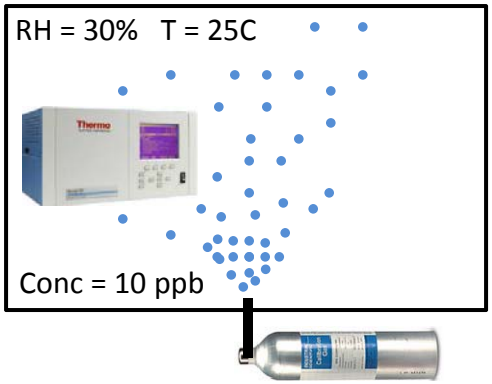
SCAQMD "AQ-SPEC"
Preliminary Budget Estimate

FIELD TESTING
(Side-by-side comparison w/ FRMs)

vs

+

LAB TESTING
(Controlled conditions)



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Equipment start-up costs: ~$600 K*

Recurring costs (Staff & material): ~$500 K/yr*

*Does NOT include the development of a clearinghouse website

"AQ-SPEC" Concept

If Board approved:

- ✓ Provide needed guidance and clarity for ever-evolving sensor technology & data interpretation
- ✓ Minimize confusion
- ✓ Catalyze the successful evolution / use of sensor technology
- ✓ <u>First in the Nation!</u>

Recommendation

Formally establish “AQ-SPEC” program at July 2014 Board Meeting