

AEROSOL METROLOGY FOR CLIMATE MARCH 14 – 15, 2011



Opening Remarks

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WELCOME & THANKS



✘ Welcome to NIST

- + Advanced Measurements Laboratory Complex
 - ✘ New special purpose laboratory capabilities

✘ Special Thanks

- + To the organizing committee
- + Two special folks without whom we would not be here today
 - ✘ Dr. Dianne Poster
 - ✘ Ms. Donna Kimball

U.S. CLIMATE CHANGE AGENDA

The Obama Administration is committed to leading the charge to reduce the dangerous pollution that causes global warming.



✘ Areas emphasized by the Obama Administration in climate change

+ Monitoring Emissions

- ✘ Need for measurement data of known quality to facilitate sound environmental decision-making and regarding chemical levels and trends

+ Climate Change Science and Education

- ✘ Need for evaluated data and models to facilitate pollution prevention, control, and reduction

+ Climate Change Adaptation

+ International Leadership



NIST GREENHOUSE GAS AND CLIMATE SCIENCE MEASUREMENTS PROGRAM

× Vision:

NIST, working with industry, other Federal agencies and the states, will develop or extend internationally-accepted measurement standards, methodologies, and technologies to enhance science-based greenhouse gas emission inventories and measurements critical to better understanding processes driving climate and weather.

Program Objectives:

Increase confidence in GHG inventory determination improving existing measurements technology and methodology performance.

Deliverable: Validate methodologies for field measurements of GHG point source emission inventories with accuracies of < 5% and traceable to the SI.

Develop and validate advanced measurement tools that improve quantitative determination and validation of GHG sources and sinks and the accuracy of climate science measurements

Deliverable: Transfer new, validated diagnostic and measurement technologies to the private sector and embody their usage methodologies in consensus standards.

Deliver new and improved standards necessary to enhance the accuracy of satellite observations

With Industry and other agencies, develop, deploy, and demonstrate measurements, standards, and methodologies necessary to reconcile U.S. inventories with atmospheric GHG monitoring observations as a means of achieving MRV requirements

Deliverable: Develop enhanced quantitative reconciliation capabilities and demonstrate in a major U.S. geographical region.

NIST PROGRAM COMPONENTS

- ✘ **Point Source Metrology**
 - + Continuous Emission Mon. Test Bed
- ✘ **Distributed GHG Source Metrology**
 - + Flux Measurement Tools
 - + Emission Dispersion Analysis
 - + Field Reference Site
- ✘ **GHG Measurements, Standards, Ref. Data, and Tools**
 - + Gas Concentration Standards
 - + Atmospheric Lifetime References
 - + Spectroscopic Reference Data
 - + Documentary Standards & Assessment Methodologies
- ✘ **GHG Inventory & Regional Emissions Profile Methodologies**
 - + Region Criteria Development
 - + Stakeholder Identification
 - + Demo. Project Planning and Imp

- ✘ **Advanced, Field-Deployable Detection Technologies**
 - + Frequency Comb IR Sources
 - + Advanced Atmospheric Monitoring Tech.
- ✘ **Satellite Calibration**
 - + Optical Reflectance and Transmittance Standards
 - + Microwave Standards
 - + Thermal Infrared Standards
 - + Scene Generation
- ✘ **Aerosol Measurement Science**
 - + Black Carbon Morphology
 - + Black Carbon Bulk Properties
 - + Black Carbon Optical Properties

ARRA Research Grants

- Measuring Greenhouse Gas Emissions by Inverse Methods: A Pilot Program - Scripps & LLNL
- Development, Improvement, and Assessment of the Accuracy of Aircraft-Based Mass Balance Measurements of the Integrated Urban Emission Fluxes of Greenhouse Gases – Purdue, Univ. Colo., and Penn State Univ.
- Multi-wavelength LIDAR System to Characterize Atmospheric Composition & Chemistry – Michigan Aerospace
- Buoy Sensor Technology for Long-Term Submerged Observation of the Marine CO₂ System and Isotopic Composition – Wood Hole Oceanography Institution

Radiative Forcing & NIST's Climate Program

