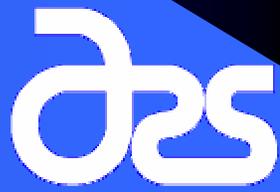


ARS Soil & Air Resources
National Program
Air Quality and Global Change
Workshop

Charlie Walthall
National Program Leader
NP212



Purpose of this Workshop

- Recommend priorities for 5 years of ARS research
 - ability of agriculture to reduce its impact on air quality and global climate,
 - adaptation to and mitigation of, the effects of global change on agriculture.

Expected Outcomes

- **By the end of the meeting, participants will have recommended:**
 - Priority areas for ARS-wide research
 - Elements of the Action Plan (including what efforts ARS should not do or de-emphasize)

Expected Outcomes

- Identified links with other ARS National Programs
- Considered the Agency's resource constraints
- Suggested ARS research complimentary to research of
 - other Federal agencies
 - private sector
- Recommended opportunities for improved cooperation and technology transfer
 - between ARS and the private sector
 - between ARS and other government agencies

Workshop Participants

- ARS Scientists (SYs), National Program Staff, Administration
- Agriculture Industry
- Producers
- Federal Agencies
- State Agencies
- International Collaborators
- Non Government Organizations



Air Quality Definition

*Condition of the air in the surrounding environment.

**“Composition”*

Definition of Global Change

“changes in the *global environment* that may alter the capacity of the Earth to sustain life”.

(including alterations in climate, land productivity, oceans or other water resources, atmospheric chemistry, and ecological systems)

U.S. Global Change Research Act of 1990 [Public Law 101-606(11/16/90) 104 Stat. 3096-3104]

***NP212 (Soil & Air Resource Mgmt.)**

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NP202 (Soils)

+

NP203 (Air Quality)

+

NP204 (Global Change)

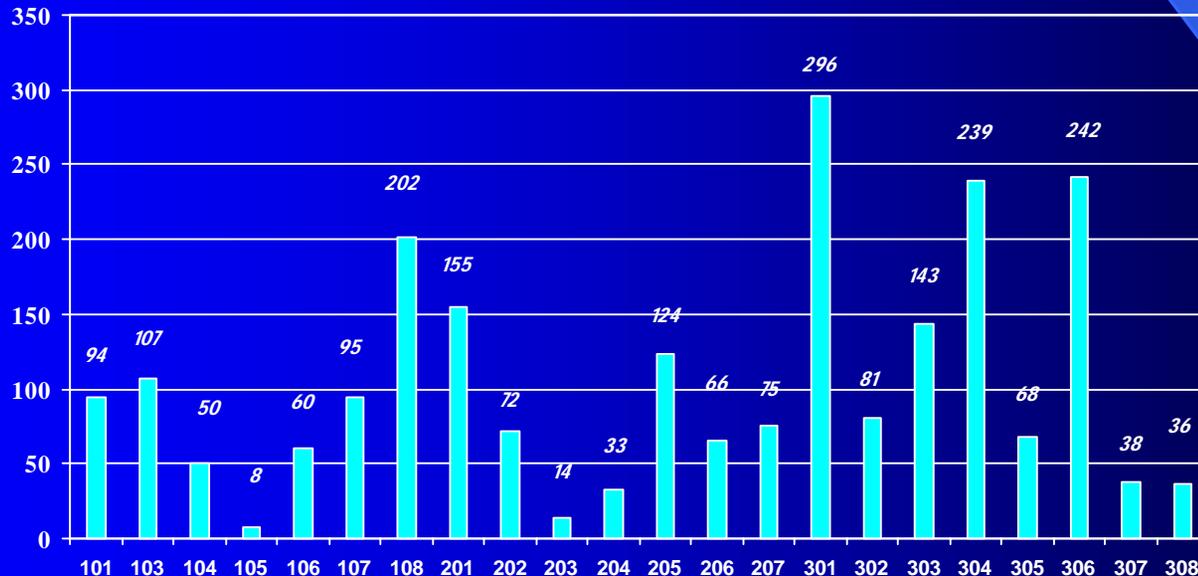


“Boundary Layers Program”

National Programs (2007)

- NP 203 Air Quality ~ \$8 M/ 14 FTE
- NP 204 Global Change ~ \$12 M/ 33 FTE

NATIONAL PROGRAM SY TOTALS



NATIONAL PROGRAM CODE

Contributing Programs

- **Air Quality Research: \$17.5 M**
 - NP 202 Soils
 - NP 206/214 Manure & Byproduct Utilization
 - NP 207/215 Rangeland, Pasture & Forages
 - NP 201/211 Water Availability & Watershed Management
 - NP 302 Plant Biological & Molecular Processes
 - NP 306 Quality & Utilization of Ag Products
 - NP 108 Food Safety (Plant & Animal Products)
- **Global Change Research: \$39.7 M**
 - NP 202 Soils
 - NP 206/214 Manure & Byproduct Utilization
 - NP 207/215 Rangeland, Pasture & Forages
 - NP 201/211 Water Availability & Watershed Management
 - NP 301 Plant Genetic Resources, Genomics & Genetic Improvement
 - NP 302 Plant Biological & Molecular Processes
 - NP 307/213 Bioenergy & Energy Alternatives

**NP216 Agricultural System Competitiveness and Sustainability

Partnerships & Collaborations

- Federal Agencies
 - USDA: NRCS, FS, CSREES
 - NASA
 - NOAA
 - EPA
 - DOE
- State Governments
- Non Government Organizations (“NGO”s)
- Universities
- Industry

Existing Air Quality Action Plan

- Understand the processes of air pollution emissions from agricultural enterprises and the effects of air quality upon agriculture,
- Develop and test control measures,
- Provide decision aids useful for minimizing and reducing agricultural air pollution emissions and predicting and mitigating the impacts of air quality upon agriculture.

Existing Action Plan Components: Air Quality

- Particulate **Emissions**
- Ammonia & Ammonium **Emissions**
- Malodorous Compounds
- Ozone **Impacts**
- Pesticides & Other Synthetic Organic Compounds
 - VOCs



Existing Global Change Action Plan

- **Mission:** Develop and provide adaptation, mitigation, and management strategies to the individual farm, ranch, and rural community, and to natural resource decision-makers to allow them to derive optimal benefit from the positive aspects of global change and deal effectively with the detrimental effects.

Existing Action Plan Components: Global Change

- **Carbon Cycle & Carbon Storage**
- **Trace Gas Emissions**
- **Agricultural Ecosystem Impacts**
- **Weather & Water Cycle Changes at Farm & Larger *Scales***

Synthesis and Integration of Research Findings

- Synthesize info from all sources
- “Enhance value of published research”
- U.S. Ag & Forestry GHG Inventory contributions

**The Potential
of U.S. Cropland to
Sequester Carbon
and Mitigate the
Greenhouse Effect**



R. Lal • J.M. Kimble
R.F. Follett • C.V. Cole

Setting the Stage....

Global Change Research

- Global change and public concern/interest
- Mainstream media attention....
- Current Administration's position: we have a problem....
- Intergovernmental Panel on Climate Change
 - *Nobel Prize*
- U.S. Synthesis and Assessment Products
 - **SAP4.3 "The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity"**

Setting the Stage....Global Change Research

- United States Climate Change Science Program (CCSP) new Strategic Plan
 - Interagency Working Groups (IWGs)
- USDA Climate Change Strategic Plan
 - Under development
- World Food “Crisis”
- Bioenergy



Setting the Stage....Global Change Research

- Urbanization & population growth
- Environmental credit trading and carbon sequestration
 - Science basis?
 - Verification?
- “Scaling up” for agricultural impact assessment
 - Plot to landscape to region to globe...
- New administration in 2009

“OK – we have a problem....what are we going to do about it????”

Setting the Stage....

Agricultural Air Quality Research

- EPA Regulations mandates
 - Agriculture focus
 - Basic data lacking for regulations
 - Space and time frameworks for emissions data not well defined or understood
 - Basis for regulations??
 - Greenhouse gas emissions

Setting the Stage....Agricultural Air Quality Research

- Urban/suburban encroachment on agricultural landscapes
 - Odors
 - Health concerns
- “Big picture” question: Impact of agricultural on regional and global air quality? (“Scaling up”)
- World Food “Crisis”

Setting the Stage....Agricultural Air Quality Research

- USDA-NRCS interest: Air Quality & Atmospheric Change Team
- Management practices for controlling emissions from agricultural sources
- Effectiveness of controls??
- Agricultural Air Quality Task Force (AAQTF) Federal Advisory Committee Activity (FACA)

Earth Observations

- Group on Earth Observations (GEO)
 - 63 Nations
 - Observation systems for oceans, land, water, atmosphere
 - Air quality, global change, water
- U.S. Group on Earth Observations (USGEO)
 - 20+ Federal Organizations
 - Observation systems
 - Air Quality, global change, water

We are at a critical point in time concerning the challenges of global change and agricultural air quality.

Workshop Agenda

- Day 1 afternoon: What are the problems?
- Day 2 morning: What are the priorities?

-----Customers & Stakeholders Adjourn-----

- Day 2 afternoon: What did we hear?
- Day 3 morning: What are we going to focus our science on?
- Day 3 afternoon: How do we do this?

Proposed New Action Plan Structure: Focus of Discussions

- Component 1: Reducing Agricultural Emissions to the Atmosphere
- Component 2: Adapting Agriculture to Global Changes

Suggested Terminology for Discussions

- Stakeholders, customers (“society”) have

PROBLEMS

- Scientists solve these problems with solutions gained from answering scientific

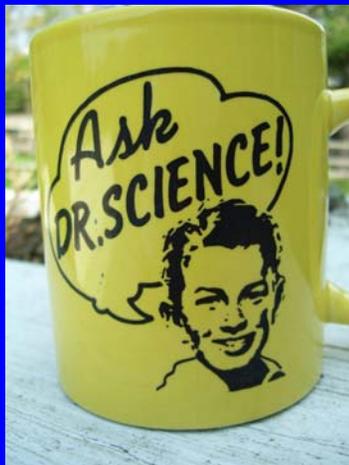
QUESTIONS

Suggested Terminology for Discussions

- **Understand**

- **Predict**

- **Control**



Thank you!