USDA-NRCS Atmospheric Change Activities

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USDA-NRCS-WNTSC
Portland

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Who We Are

Air Quality & Atmospheric Change Team:

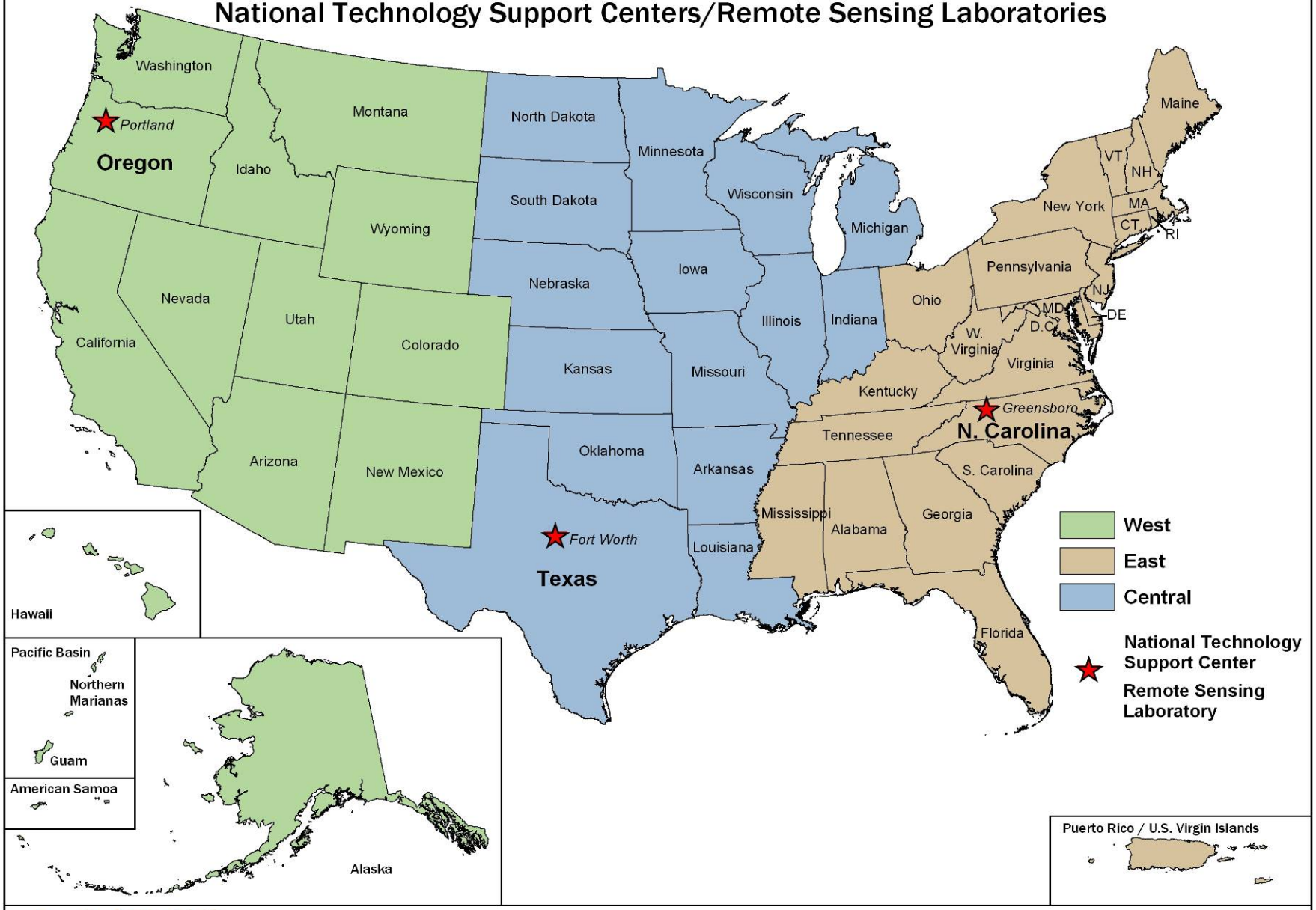
- Greg Johnson, Leader
- Susan O'Neill, Air Quality Scientist
- Greg Zwicke, Air Quality Engineer
- Air Quality Scientist (vacant)

also…

Michele Laur, Nat'l Atmos Resource Specialist (ESD, NHQ)
Ron Heavner, Nat'l Air Quality Specialist (CED, NHQ)

NRCS

Natural Resources Conservation Service
National Technology Support Centers/Remote Sensing Laboratories



U.S. Department of Agriculture
Natural Resources Conservation Service
Resources Inventory Assessment Division
Washington, D.C. April 2007

Why an emphasis on Air Quality and Atmospheric Change?

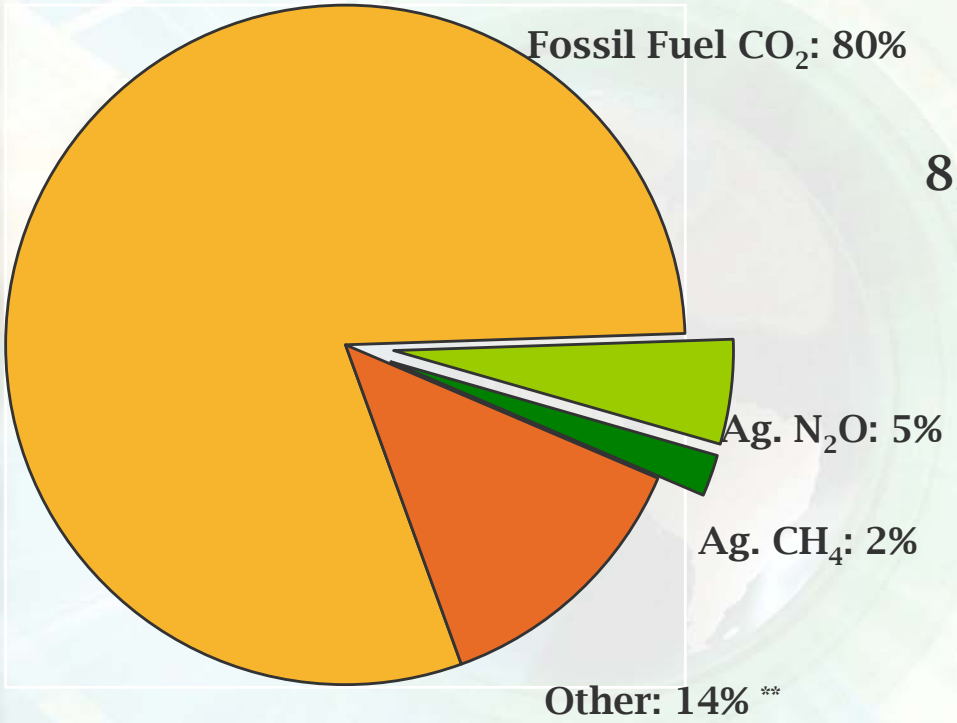
- New and emerging areas of focus for the NRCS
- Increasing AQ regulatory pressure on agriculture
- Increasing emphasis on greenhouse gases
- We tend to stovepipe resource analyses
- Examination of how air quality and atmospheric change are related to other resources (SWAPA+H)

Within the US:

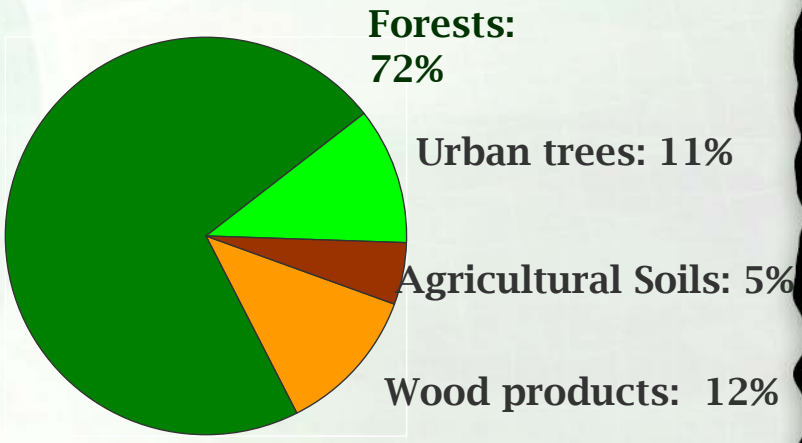
Agriculture accounts for 7 % of GHG emissions

Carbon sequestration offsets 11 % of U.S. emissions

U.S. GHG Emissions:
7,260 million metric tons CO_2e



U.S. Carbon Sequestration:
828.5 million metric tons CO_2e



Source: US EPA. 2007. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 - 2005

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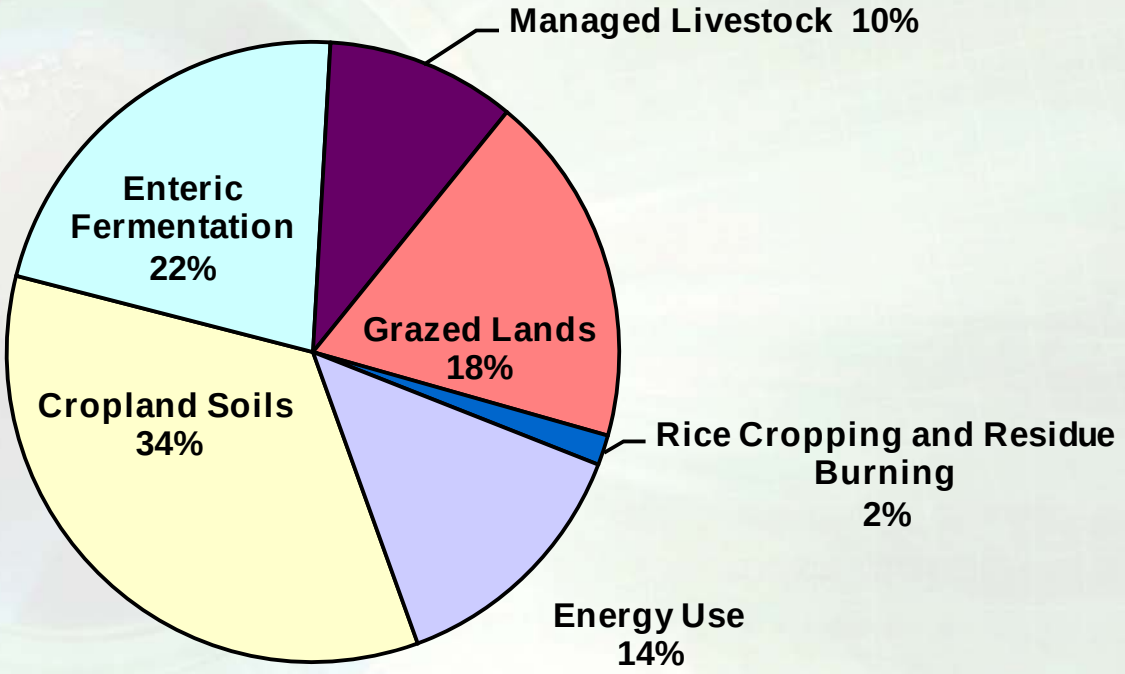
Within agriculture: Half of emissions are from livestock and grazing, A third are from cropland nitrogen, and the remainder from energy use and small sources



U.S. Agriculture and Forestry Greenhouse Gas Inventory: 2005

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AQAC and NRCS Planning

NRCS works with private landowners nationwide to conserve natural resources

Conservation practices and systems are used to address resource concerns. One of the 4 AQAC resource concerns is Greenhouse Gases and Carbon Sequestration

There are nearly 170 conservation practice standards. Several have significant relationship to GHG/carbon (nutrient management, residue management, combustion system improvement, anaerobic digester, etc.)

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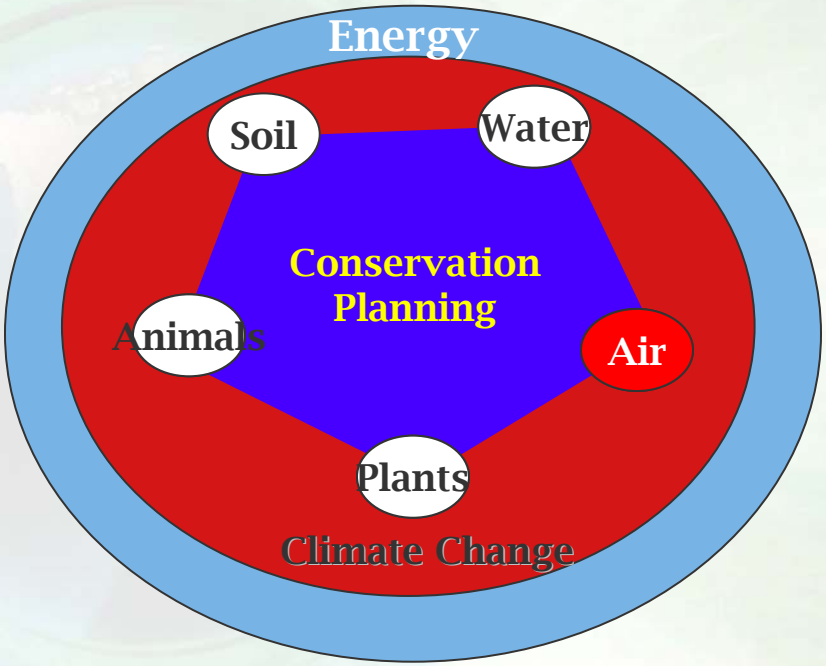
Addressing Air Quality: The Holistic Approach to Addressing Resource Issues

Air Quality, Energy and Climate Change are Integral in the Total System



Climate Change & NRCS

- Now one of the few agency Strategic Initiatives directly reporting to the Chief
- Have established 2 climate change-related teams to address these issues
- NRCS Programs GHG benefits analysis
  - For 2002, 2007, and out to 2020
- Now making plans for potential climate change legislation
  - Eligible practices and GHG/carbon seq. effects
  - Developing credit schemes

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Climate Change & NRCS

- Oversight of the CarbOn Management Evaluation Tool for the voluntary reporting of GHGs (COMET-VR): Developed by Colorado State University, ARS and NRCS. Utilizes Century soil organic model
  - www.cometvr.colostate.edu
- Soil Survey Division conducting the Rapid Assessment of U.S. Soil Carbon for Climate Change and Conservation Planning
- National Water and Climate Center at NRCS Portland examining climate variability/change effects on Western snow and water supply forecasts

NRCS Programs and GHGs/Carbon

- NRCS administers a variety of conservation programs, including the Environmental Quality Incentives Program (EQIP), the Conservation Stewardship Program (CSP), etc.
- EQIP funding now nearly $2 billion
- Clear language in Farm Bill to address carbon market
- Prioritizing new and innovative approaches to manage GHG emissions and enhance sequestration

NRCS

Approaches to Greenhouse Gas Regulation

Traditional Command and Control

- Regulatory agency sets standards
  - Specific technologies (scrubbers)
  - Performance (tons, tons/unit output)

Cap and Trade

- Regulatory agency sets overall objective (total allowable emissions)
  - Allocates or auctions emission allowances
  - Firms must obtain allowances in order to emit a pollutant
    - Firms can receive allowances, purchase allowances, or reduce emissions

Cap and Trade with Offsets

- Unregulated firms can receive credits for reducing emissions
- Regulated firms can purchase offset credits to meet regulatory requirements ("offsetting emissions")

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Issues with Offsets

Offsets are produced by entities that are not regulated:

- Would the action have happened anyway? (Additionality)
- Will other firms/entities fill gaps if the action results in a drop in production? (Leakage)
- What are we measuring benefits against? (Baselines/benchmarks)

Carbon sequestration is unique:

- Will the carbon that is sequestered and stored be kept out of the atmosphere? (Permanence)

Most agriculture and forestry sources and sinks are not well defined "point" sources:

- Can we truly assess the benefits? (Measurement uncertainties)

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Steps in Determining Carbon Offsets

Determine eligible practices

Establish metrics for quantifying greenhouse gas benefits

Establish reporting requirements

Provide technical assistance – technical service provision to assist in planning and implementation

Certify implementation

Maintain registry of information, recordkeeping, including ensuring against duplicate records

Conduct audits and spot checks

Award offsets or issuance of incentive payments

Monitor against loss of carbon that is sequestered

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Agriculture and Forestry in HR 2454

Specifies schedule of annual GHG emissions caps for covered sectors from 2012 to 2050.

Covered sectors account for 85% of current US GHG emissions

Cap would reduce emissions from covered sectors:

17% by 2020, 42% by 2030, 83% by 2050

Provides for agriculture and forestry to supply offsets:

- USDA would administer the offsets program;
- Caps the use of domestic offsets at 1 billion tons of CO2e per year;
- Requires offsets account for: Leakage, Permanence, Additionality, and Uncertainties

Provides support for expanded use and production of renewable energy

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Costs and Benefits of HR 2454 to Agriculture

Main costs

- Higher prices for energy and energy intensive inputs (including fertilizer)

- Fertilizer and fuel costs account for 50-60 percent of variable costs of production for corn;
- Rural households have higher personal transportation expenditures than urban households. Would be more negatively impacted by increased gas prices.

Main benefits: Potential revenue from supplying

- Offsets to covered industries,
- Clean energy and clean energy feedstocks

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NRCS, USDA, Agriculture Climate Change-related Research Needs

- More research about N_2O emissions changes associated with conservation practices
- Whole-farm lifecycle analyses for properly evaluating new technologies addressing GHG/carbon management
- Possible collaboration with National Water and Climate Center on better snow and water forecasts for the West

Questions?

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