United States Department of Agriculture
Natural Resources Conservation Service

Recent and Upcoming NRCS Air Quality Activities

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AAQTF
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August 1, 2012

Air Quality and Atmospheric Change Training

- In class training sessions (IL, other states and regions)
  - Focus on new AQAC practices, integrating AQAC into conservation planning
- New AgLearn courses coming:
  - Why Do We Care About Climate Change?
  - Air Quality and Animal Agriculture

Integrating Air Quality into New NRCS Conservation Delivery

- Conservation Delivery Streamlining Initiative (CDSI) will deliver new conservation planning platform
- Goal is to have NRCS planners significantly more in the field, working directly w/ producers
- AQAC Team developing all AQAC info, tools, data for CDSI

AIR FILTRATION AND SCRUBBING - Practice Overview

USDA, Natural Resources Conservation Service — Conservation Practice Code 371

Air filtration and scrubbing is a device installed to reduce emissions of air contaminants from a structure via interception and/or collection.

PRACTICE INFORMATION

An air filtration or scrubbing system controls gaseous and/or particulate matter emissions from ventilated structures by inertial collection, filtration, electrostatic collection, adsorption, scrubbing, and/or bioremoval. Specifically, an air filtration or scrubbing system can be used to manage emissions of:

- directly emitted particulate matter (i.e., dust)
- volatile organic compounds (VOCs)
- ammonia
- odorous sulfur compounds
- methane

Design criteria for this practice include airflow characteristics, concentration and characteristics of contaminant(s) to be treated, expected efficiency of the system, collection and disposal for removed contaminant(s), and others. An operation and maintenance plan is developed specifically for each system.

Air filtration and scrubbing will require maintenance over the expected life of the practice.

COMMON ASSOCIATED PRACTICES

Air Filtration and Scrubbing (371) is commonly applied with practices such as Agrichemical Handling Facility (309), Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Roofs and Covers (367), and other practices.

For further information, contact your local NRCS field office.

For CDSI the AQAC Team has developed AQ information sheets for our field staff

Agricultural Air Quality Conservation Measures

- Developed with EPA-OAQPS
- A reference guide for cropping systems and general land management
- 8 sections: Soil Surface Cover, In-field Pass Reductions, Soil Conditioning / Timing of Operations, Unpaved Roadways, Wind Barriers, Equipment Modifications, Smoke Management, Other
- Focused on NRCS Conservation Practices

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Agricultural Air Quality Conservation Measures

Draft Agricultural Air Quality Conservation Measures

Reference Guide for Cropping Systems And General Land Management

June 2012

Draft Document – Do Not Cite or Quote

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Estimating Effects of Conservation Practices on Air Quality

- NRCS uses concept of “Conservation Practice Physical Effects” (CPPE) to roughly estimate likely impact on resources (air, soil, water, etc.)
- The complete CPPE matrix has been reviewed by AQAC Team for accuracy, relevance and completeness

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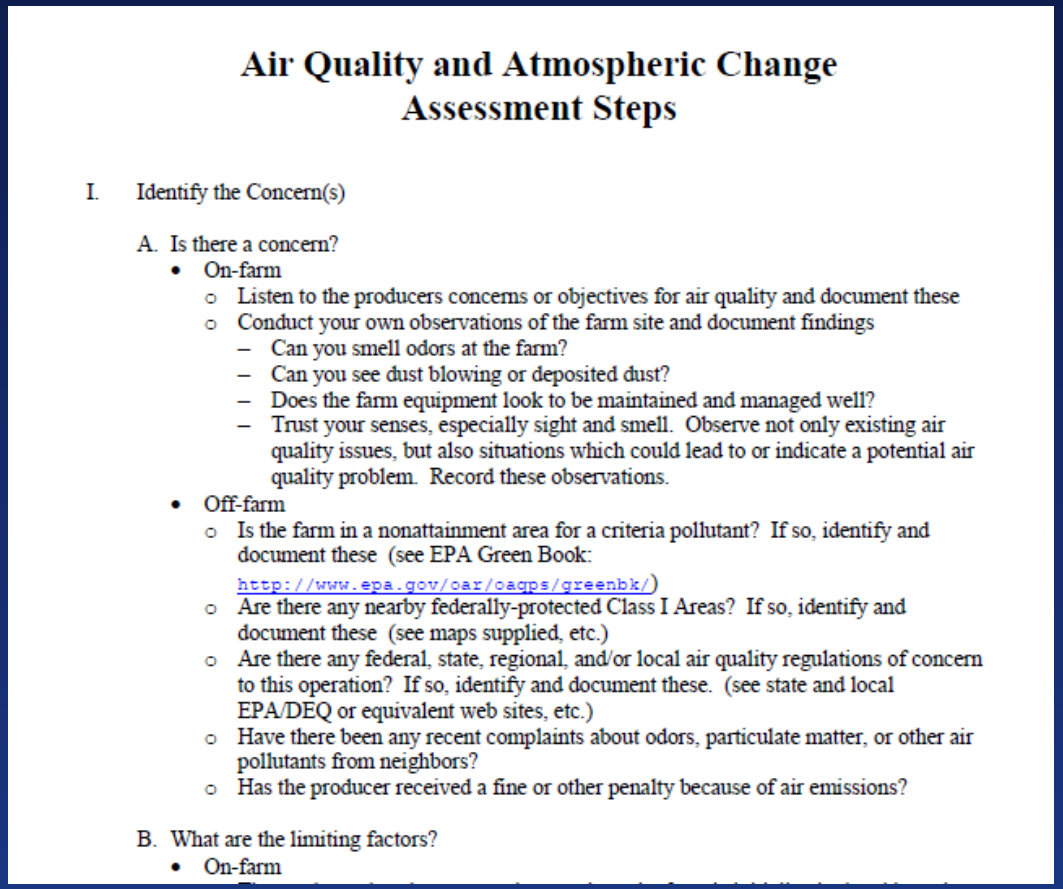
Estimating Effects of Conservation Practices on Air Quality

Resource Concerns			Air Quality Impacts							
			Emissions of Particulate Matter (PM) and PM Precursors		*Emissions of Ozone Precursors*		*Emissions of Greenhouse Gases (GHGs)*		*Objectionable Odors*	
CPPE Resource Concern Components			*Air Quality Impacts - Emissions of Particulate Matter (PM) and PM Precursors*		*Air Quality Impacts - Emissions of Ozone Precursors*		*Air Quality Impacts - Emissions of Greenhouse Gases (GHGs)*		*Air Quality Impacts - Objectionable Odors*	
Practices	Lead Discipline(s)	Practice Code	*Effect*	*Rationale*	*Effect*	*Rationale*	*Effect*	*Rationale*	*Effect*	*Rationale*
Air Filtration and Scrubbing	**CED-AQS & ESD ARS**	**371**	**Moderate to Substantial Improvement**	Various filtration and scrubbing systems are highly effective at mitigating particulate matter emissions.	**Slight to Moderate Improvement**	Some filtration and scrubbing systems can be highly effective at mitigating emissions of volatile organic compounds (VOCs).	**Slight to Moderate Improvement**	Some filtration and scrubbing systems can be highly effective at mitigating emissions of methane. However, some biofilters may also increase emissions of nitrous oxide (N2O).	**Moderate to Substantial Improvement**	Some filtration and scrubbing systems can be highly effective at mitigating emissions of volatile organic compounds (VOCs), odorous sulfur compounds, and ammonia.
Combustion System Improvement	**CED-AQS & ESC ARS**	**372**	**Moderate to Substantial Improvement**	A primary purpose of this standard is to mitigate emissions of particulate matter from agricultural combustion systems.	**Moderate to Substantial Improvement**	A primary purpose of this standard is to mitigate emissions of oxides of nitrogen (NOx) from agricultural combustion systems.	**Slight to Moderate Improvement**	Depending on the technology used to improve the agricultural combustion system, reductions in fossil fuel emissions of CO2 can be achieved.	**No Effect**	Not Applicable

AQAC Guidance Documents for NRCS Conservationists

- Assessment Steps
- On-farm Assessment Checklist



Air Quality and Atmospheric Change Assessment Steps

I. Identify the Concern(s)

A. Is there a concern?

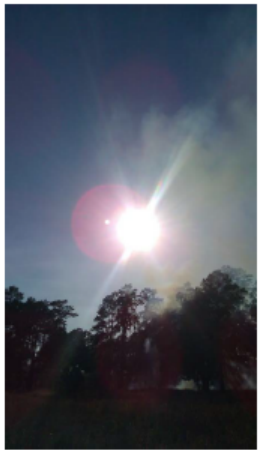
- On-farm
  - Listen to the producers concerns or objectives for air quality and document these
  - Conduct your own observations of the farm site and document findings
    - Can you smell odors at the farm?
    - Can you see dust blowing or deposited dust?
    - Does the farm equipment look to be maintained and managed well?
    - Trust your senses, especially sight and smell. Observe not only existing air quality issues, but also situations which could lead to or indicate a potential air quality problem. Record these observations.
- Off-farm
  - Is the farm in a nonattainment area for a criteria pollutant? If so, identify and document these (see EPA Green Book: http://www.epa.gov/oar/oaqps/greenbk/)
  - Are there any nearby federally-protected Class I Areas? If so, identify and document these (see maps supplied, etc.)
  - Are there any federal, state, regional, and/or local air quality regulations of concern to this operation? If so, identify and document these. (see state and local EPA/DEQ or equivalent web sites, etc.)
  - Have there been any recent complaints about odors, particulate matter, or other air pollutants from neighbors?
  - Has the producer received a fine or other penalty because of air emissions?

B. What are the limiting factors?

- On-farm

Basic Smoke Management Practices

October 2011



Fire is an essential ecological disturbance, providing many benefits to the environment in terms of wildlife, water and soil quality, and nutrient cycling. Prescribed burning can also be a means of protecting air quality by mitigating the occurrence of large wildfires and reducing invasive species. However, fire produces smoke which contains particulate matter (PM), ozone precursors, greenhouse gases, and other trace gases. Basic Smoke Management Practices (BSMPs) applied on prescribed burns can mitigate the impacts of smoke to public health, public safety and nuisance, and visibility.

Smoke is not like other air pollution sources--a direct control cannot be put on it such as can be applied to a power plant smoke stack--rather a variety of environmental factors must be taken into account to manage both the burn and the smoke from the burn. BSMPs outlined here offer a suite of options that a fire manager can utilize to reduce the impacts of their smoke. The Smoke Management Guide for Prescribed and Wildland Fire, 2001 edition (http://www.treesearch.fs.fed.us/pubs/5388) and the national smoke management website (http://www.nifc.gov/smoke) offer further technical information on how to manage smoke.

The six BSMPs discussed in this Technical Note (and summarized in Table 1) have applicability depending on the type of burn, fuels to be burned and level of effort needed to address air quality concerns. Not all BSMPs are applicable to all situations, therefore fire managers are urged to investigate the information available and applicable to their area and needs. Furthermore, these six BSMPs are only a subset of possible BSMPs and others can be adopted as needed such as no burning after November 15 due to inversions. BSMP's are utilized by the individual fire manager and may be an expectation of a state-wide smoke management program or employed to maintain the social acceptability of using prescribed fire and managing air quality impacts of smoke.

Table 1. Summary of Basic Smoke Management Practices (BSMPs), benefit achieved with the BSMP, and when it is applied (before, during or after the burn).

Basic Smoke Management Practice	Benefit achieved with the BSMP	When the BSMP is Applied – Before/During/After the Burn
Evaluate Smoke Dispersion Conditions	Minimize smoke impacts	Before, During, After
Monitor Effects on Air Quality	Be aware of where the smoke is going and degree it impacts air quality	Before, During, After
Record-Keeping/Maintain a Burn/Smoke Journal	Retain information about the weather, burn and smoke. If air quality problems occur, documentation helps analyze and address air regulatory issues	Before, During, After
Communication – Public Notification	Notify neighbors and those potentially impacted by smoke, especially sensitive receptors	Before, During
Consider Emission Reduction Techniques	Reducing emissions can reduce downwind impacts	Before, During

12 page guide to Basic Smoke Management Practices released by NRCS and FS

Ag Air Quality Support in NRCS Programs

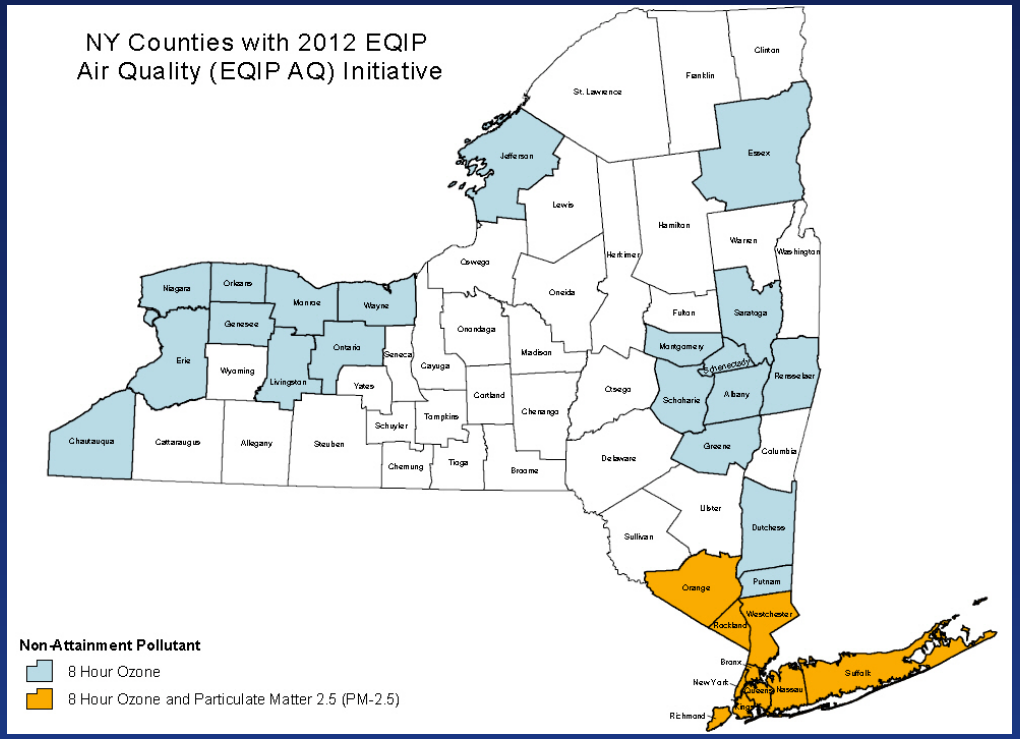
- Environmental Quality Incentives Program (EQIP)
  - Includes National Air Quality Initiative
- Conservation Stewardship Program (CSP)

2012 Air Quality Initiative (AQI)

- $37.5 million to 9 states
- CA received nearly 50%--for heavy-duty mobile off-road ag engine replacements
- Under EQIP
- Primarily for PM and Ozone, and primarily in nonattainment counties

2012 Air Quality Initiative (AQI)

- New York received $1.75 million
- 23 conservation practices available



2012 Air Quality Initiative (AQI) in NY

- New York used $1.75 million
- 8 counties participated
- Practices used: Nutrient Management, Cover Crop, Agrichemical Handling Facility, Mulching, Pest Management, Solid/Liquid Waste Separation Facility, Conservation Cover, Residue Management No-till/Strip Till/Direct Seeding, Waste Facility Cover (Roofs and Cover), Combustion System Improvement and Windbreak/Shelter Establishment

Example 2009-2012 AQI Results

- California 2009-2012
  - 1200 contracts implemented to date; 300 more in process
  - Over 2060 tons/yr NOx reduced
    - Represents 6.87 tons/day NOx (May-Oct. ozone season)
    - Equivalent to over 623,000 light-duty vehicles
    - Cost effectiveness: Approx. $2400 per weighted ton*
  - Leveraged with SJVAPCD Ag Engine replacements
    - 2011: Nearly 700 contracts; 480 tons/yr NOx
  - Seeking SJV SIP credibility for ARB farm equipment commitment for NOx reductions (5-10 tons/day)

**The average cost-effectiveness for reducing emissions from replacing mobile off-road agricultural equipment is calculated using criteria from the 2011 Carl Moyer Program Guidelines. This methodology is applied to a variety of incentive programs in California and helps provide uniform comparisons with other incentive programs in the state. Overall, the average cost-effectiveness of NRCS payments is $2,381 per weighted ton of emissions reductions, which is 14 percent of the current Carl Moyer cost-effectiveness threshold of $17,080 per weighted ton of emissions.*

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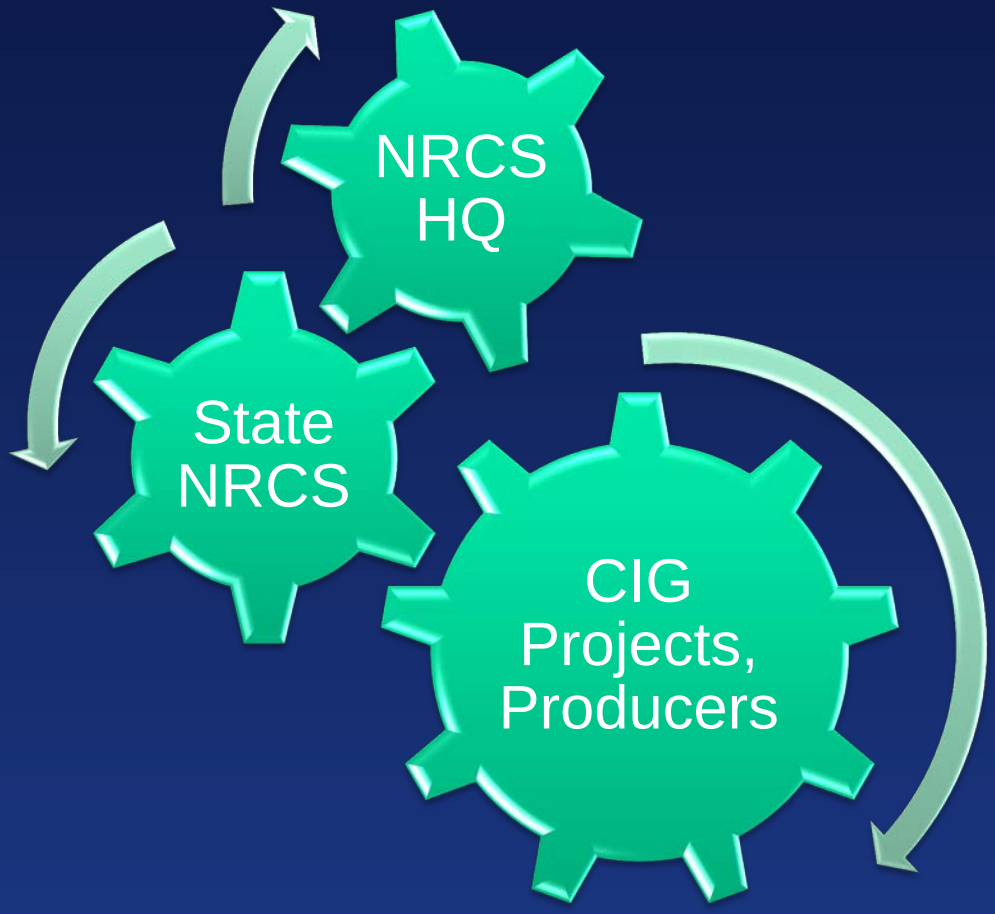
NRCS GHG CIG Projects and EQIP Funding – The Implementation Phase

NRCS GHG CIG Projects

- Nine Innovative Projects
- $7.4 Million in funding
- Up to $10 Million in FY2013 EQIP funds available – FY2014 dependent on FY2013 rollout
  - Not all projects have been developed to incorporate EQIP-assisted producers

Management Structure - All of the EQIP Gears Must Mesh

- NHQ Programs
- National Tech Teams
- National Tech Contact
- State Conservationist
- State Programs Office
- Local NRCS
- CIG Team
- Producers



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Ducks Unlimited and The Climate Trust CIG Project (Note: this project will not utilize EQIP Funding)

Preserving Grasslands And Not Tilling – grazing permitted

DUCKS UNLIMITED

PLUS
Soil Carbon Credits

Aggregation

The Climate Trust

SALE

VOLT

CHEVROLET

$$$ Return to Producer via DU for Avoided Grassland Conversion

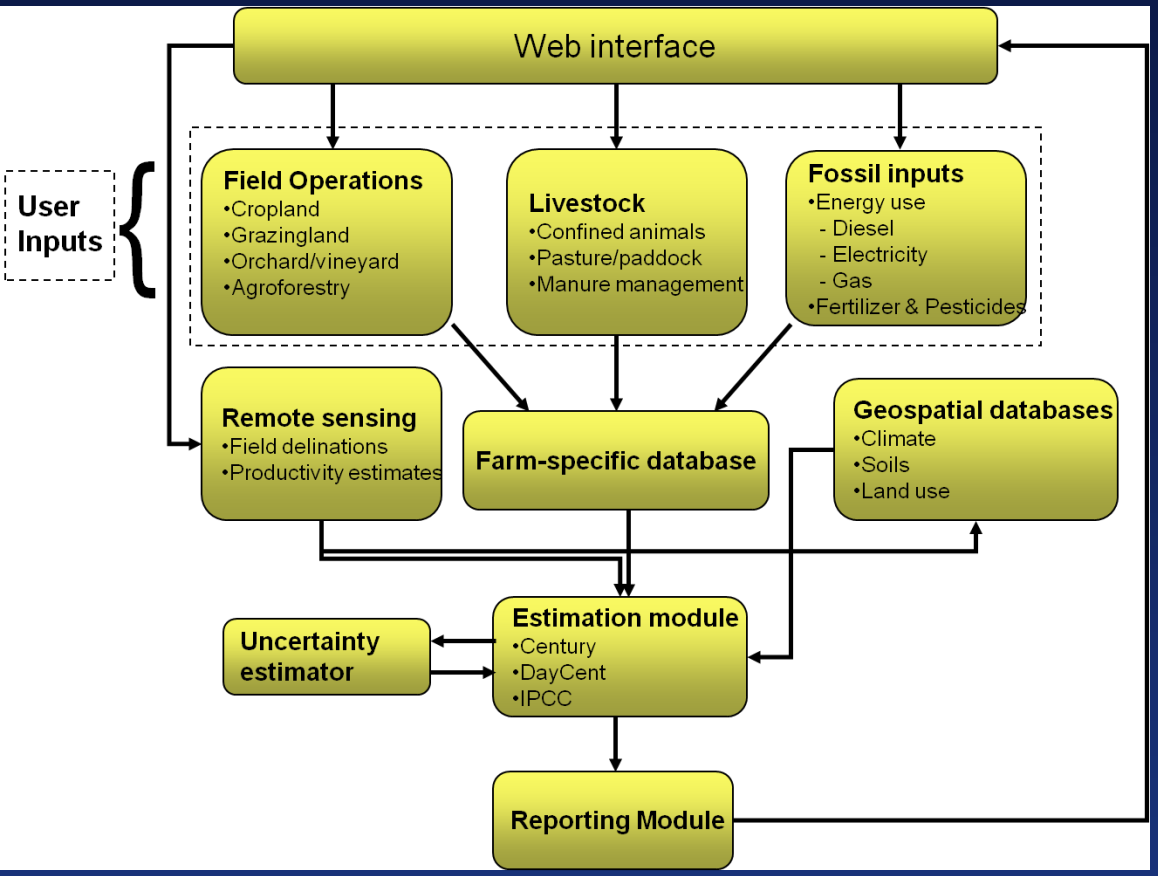
Interesting CIG Case Study: Demonstrating GHG Emission Reductions in California and Mid-South Rice Production

- NRCS and CIG Project EQIP Funding discussions have identified a potential conflict of migratory bird habitat and reducing methane emissions
- Offsets credits are generated through:
  - Minimizing/avoiding winter flooding
  - Removing straw after harvest
  - Drill (dry) seeding
- Migratory birds depend on:
  - Winter Flooding
  - Available waste grain
  - Aquatic species

NRCS & Climate Change Adaptation

- Response to USDA Regulation 1070-001 of June 2, 2011, implementing sections of Executive Order 13514 issued on October 5, 2009: Federal leadership in environmental, energy, and economic performance (CEQ-driven)
- NRCS Climate Change Coordination Team formed and active; developing strategy for determining vulnerabilities to climate (change, variability), and adaptation path--examining impacts to agriculture and natural resources
- First Adaptation Plan officially released by NRCS on May 23, 2012; Now in the process of developing more specific steps for the next 1-10 years

COMET-Farm Update



- Beta Version fully released in August
- Well-received by the user community – forthcoming GHG regulatory program (cap and trade) in CA
- Serving NRCS user groups as well as environmental market for GHGs (N_2O, CH_4, CO_2)
- Plans to embellish the current tool with:
  - CDSI (internal NRCS)
  - Agroforestry
  - Lime, Rice, Specialty Crops
  - Linkage with GHG quantification protocols

http://cometfarm.nrel.colostate.edu/

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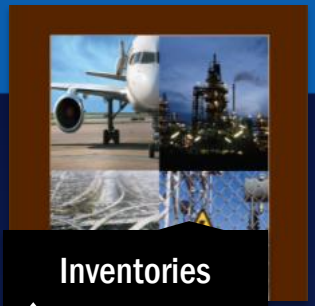
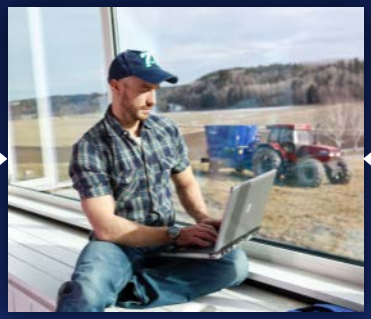
Policy Assessments



Inventories

Ecosystem Service Markets

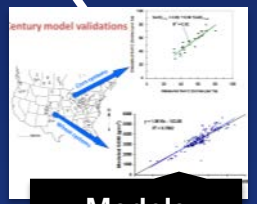
Farm Management Tools



Farm Community

Geographic Databases

Remote Sensing Data



Models

Measurement Network

COMET-Farm User Experience – drawing upon an extensive data network

AQAC Team Personnel Update

- Dr. Susan O'Neill left on July 1 to return to the USFS Research Station in Seattle where she is resuming her atmospheric modeling work

Questions?

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