



Update on USDA Climate Change Activities



Climate Change Program Office
USDA Office of the Chief Economist

August 1, 2012

USDA Climate Change Activities

- ***Greenhouse Gas Mitigation Options and Costs for Agricultural Land and Animal Production within the United States (anticipated for release Summer 2012)***
- ***Science-Based Methods and Technical Guidelines for Quantifying Greenhouse Gas Sources and Sinks in the Forest and Agriculture Sectors***
- ***USDA Climate Change Adaptation Plan***
- ***USDA Comments to the EPA Science Advisory Board Biogenic Carbon Emissions Panel***





***Greenhouse Gas Mitigation Options and Costs for
Agricultural Land and Animal Production within the United
States***

Purpose of the Mitigation Report

Facilitate a better understanding of how agriculture producers might respond to incentives to adopt specific GHG mitigating production and land management practices and technologies.

Report Structure

Identify specific GHG mitigating production and land management technologies and practices farmers could adopt if offered financial incentives to reduce the GHG footprint of their operation. Describe each technology or practice, and analyze available data on cost of implementation, potential mitigation, etc.

In addition to the Report, the information will be presented as a series of fact sheets by practice or technology.



PRACTICES CONSIDERED: Crop Production Systems

Field Management and Tillage Operations Mitigation Options

- Reduced Tillage Intensity
 - Switch from Conventional to Reduced Tillage
 - Switch from Conventional Tillage to No-Till
 - Switch from Reduced Tillage to No-Till
- Crop Rotation Changes
- Qualitative Assessments
 - Field Burning Elimination
 - Reduced Lime Application
 - Rice Cultivation

Nutrient Management Mitigation Options

- Reduce Application Rate
- Shift From Fall Fertilizer Application to Spring
- Fall to Split Spring Fertilizer Application
- Use of Nitrification Inhibitors or Urease Inhibitors
- Precision Agriculture
 - Late Spring Nitrate Test (LSNT)
 - Dynamic Base (Adapt-N)
 - Active Nitrogen Sensor



PRACTICES CONSIDERED: Animal Production Systems

Manure Management

- Anaerobic Digesters
 - Covered Lagoon Digester
 - Complete Mix Digester
 - Plug Flow Digester
- Covering Existing Lagoon
- Improved Separation
- Nitrification/ Denitrification

Enteric Fermentation

(qualitative assessments)

- Modification of Diet Composition and Level of Intake
 - Increasing Dietary Fat Content
 - Providing Higher-Quality Forage
 - Increasing Protein Content of Feed
 - Decreasing the Forage-to-Concentrate Ratio and Adding Supplemental Concentrates
 - Processing/Grinding Feed
- Monensin and Other Feed Additives
- Breeding for Increased Productivity and Decreased CH₄ Production

Grazing Land Management

- Legume Interseeding
- Qualitative Assessments
 - Rotational Grazing
 - Fertilization
 - Irrigation
 - SilvoPasture



PRACTICES CONSIDERED: Land Retirement Systems

Land Retirement Systems

- Retire Cultivated Organic Soils and Establish Conservation Cover
- Retire Marginal Croplands and Establish Conservation Cover
- Restore Wetlands
- Establish Windbreaks
- Restore Riparian Forest Buffers



For each practice or technology, we provide:

1. A detailed technical description of the technology or practice
2. For “representative” farms, estimates of adoption costs.
3. Estimates of the farm-level GHG mitigation associated with adoption (i.e., increase in carbon sequestration or decrease in GHG emissions).
4. Assess the GHG incentive levels that various “representative” farms would require to consider adoption a break-even undertaking.





***Developing Science-Based Methods
and Technical Guidelines for
Quantifying Greenhouse Gas Sources and Sinks in the
Forest and Agriculture Sectors***

PROJECT GOAL

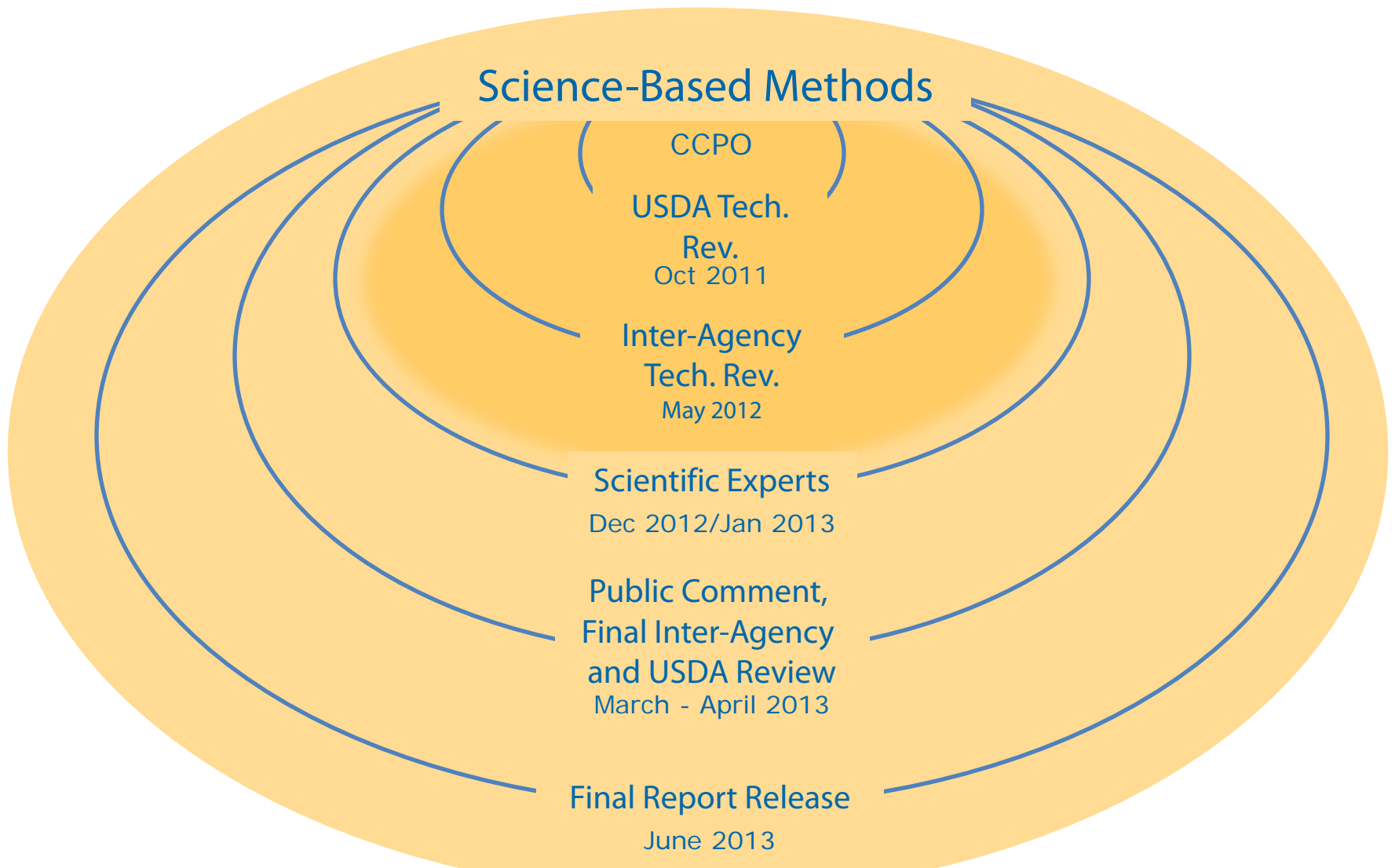
Goal: To create a standard set of GHG quantification methods and tools for landowners, USDA, and other stakeholders.

- Phase 1: Report outlining comprehensive science-based methods for entity-scale GHG estimation.
- Phase 2: Develop a user-friendly tool that follows the methods report to provide land owners and managers with reliable and understandable estimates of GHG emissions and C sequestration.

This presentation will focus on current status of the project and the project timeline.



METHODS REVIEW PROCESS



INTER-AGENCY TECHNICAL ADVISORY GROUP REVIEW RECENTLY COMPLETED

- Our Inter-Agency technical team comprises nearly 70 members across numerous Federal Agencies including USDA, OMB, State, EPA, DOE, DOI, several Whitehouse Offices and others
- Reviewers provided input on the methods proposed as well as the scientific justification
- Comments received are being reviewed by our author teams and final edits are being made prior to the Scientific Expert Review later this fall.



PROJECT TIMELINE AND KEY DATES

2011

- ✓ Selected Lead Authors
- ✓ Formed Inter-Agency Tech Advisory Group (Jan 2011)
- ✓ Published FR Notice for public technical input (Feb 2011)
- ✓ Invited key experts to join author teams (Jan 2011)
- ✓ First draft completed (Sept 2011)
- ✓ USDA initial review and contractor initial editorial review (Oct 2011)

2012

- ✓ Tool Development Commences (Feb 2012)
- ✓ Inter-Agency Tech. Adv Group review of second draft of methods (May 2012)
- ❑ Expert Peer Review of third draft of methods (Dec 2012-Jan 2013)

2013

- ❑ Full USDA and Inter-Agency review and public comment (Mar-Apr 2013)
- ❑ Ver. 1.0 of Tool available for initial testing (Apr 2013)
- ❑ Release of Final Methods Report (June 2013)
- ❑ Review and testing of the tool (Ver2.0) and 1st DRAFT users manual (Jun 2013)
- ❑ Ver 3.0 Tool and users manual published (Sept 2013)





USDA Greenhouse Gas Estimation Tool

Overview

Users

Farmers/ Ranchers/
Forest Landowners or
other stakeholders



Outputs

Report of estimated
GHG Emissions and sequestration
 CO_2 , N_2O , CH_4

Inputs

- Acres
- Cattle Count
- IPCC Equations
- Other Equations
- Lookup Tables
- Emission Factors
- Etc.



Online Estimation Tool

Croplands

Wetlands

Animal
Agriculture

Forestry

Offline Models



- DAYCENT /CENTURY
- DNDC
- COMET-VR 2.0



- DNDC
- FVS



- Holos*
- DairyGEM*



- FVS
- iTree, MRLC
- FOFEM

Intended Uses for the Tool

- Farm, ranch and forest land owners will use the TOOL to better understand the GHG impact of their management decisions.
- The TOOL will provide land owners and managers with knowledge and understanding to facilitate their entry into state or private registries or markets.
- USDA will use the TOOL to assess local (GHG) performance of conservation programs, practices and initiatives.

The Tool will likely be useful for or adaptable to the needs of other stakeholders such as NGOs, state or local registries, etc.



HOW the AAQTF CAN PARTICIPATE

- Identify workshops for demonstrating key features of tool and seeking feedback from stakeholders (Fall 2012)
- Provide comments during the public review process (Early 2013)
- Provide names of farmers who would be willing to test the tool (Early 2013)
- Provide actual case studies of business as usual practice and implemented alternative practices for reducing GHG emissions (Jan 2013)





USDA Climate Change Adaptation



U.S. Department Agriculture

Adaptation Planning

- **June 2011** - Department Regulation provided framework for sub-agency level adaptation planning
- **March 2012** – USDA High-Level Analysis of Vulnerability to Climate Change
 - http://www.usda.gov/oce/climate_change/files/FINAL_Adaptation_Planning_High_level_vul_FINAL.pdf
- **June 2012** - Climate Change Adaptation Plan to submitted to Council on Environmental Quality
 - Identifies USDA goals and priorities affected by climate change
 - Outlines projected effects of climate change on USDA function and operations
 - Describes actions for better understanding risks, opportunities and how to reduce vulnerabilities
 - Appendices include adaptation plans for USDA agencies



USDA Climate Change Adaptation Plan

June 2012

- **Introduction**
 - Role and Mission of USDA
 - USDA Strategic Goals and Background on Climate Change Efforts
 - Executive Directives and the Role of USDA
- **Vulnerability Assessment**
 - Climate Change Impacts on USDA Functions
 - Climate Change Impacts on Agricultural Production
 - Climate Change Impacts on Forests and Grasslands
 - Economic Effects of Climate Change on U.S. Agriculture
 - Agency Assessments of Risk and Vulnerability
 - Physical and Biological Climatic Concerns
 - Marketing and Trade Concerns
 - Infrastructure Concerns
 - Capacity Building
 - Processes for Assessing Impacts and Vulnerabilities
 - USDA Challenges in Identifying Impacts and Vulnerabilities
- **Federal Government Activities on Climate Change and USDA's Role**
- **Appendix: USDA Agency Plans**
 - ARS, APHIS, ERS, FAS, FSA, FS, NASS, NIFA, NRCS, RD, RMA, and CCPO



Planning Guidance for USDA Agencies

- Policy Framework
- Vulnerability Assessment
- Adaptation Planning and Evaluation Process
 - Includes integration of climate change adaptation into agency policies, programs and operations
 - Understanding risks
- Sustained Adaptation Process
- Actions to Address Risks and Opportunities



Next Steps

- Public Release of USDA Adaptation Plan
- Regional Adaptation Workshops and Listening Sessions
- USDA Agencies' Plan Updates
- Implementation





***USDA Comments to the EPA Science Advisory
Board Biogenic Carbon Emissions Panel***