

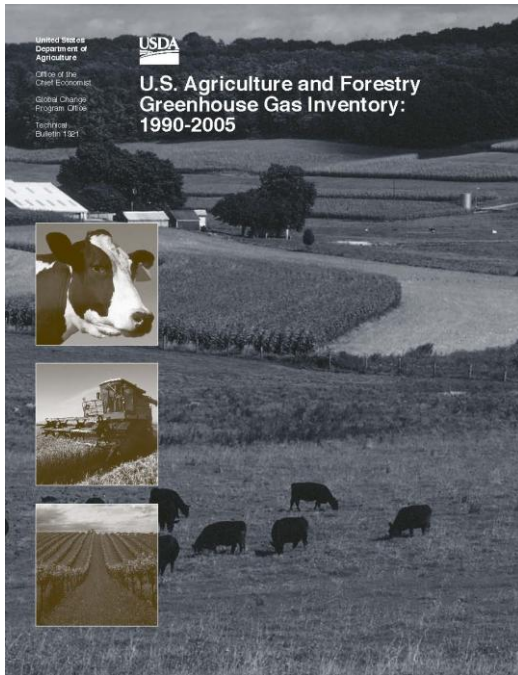


Technical Guidelines and Scientific Methods For Farm- or Entity-Scale GHG Inventory



The Climate Change Program Office ongoing inventory efforts (1)

USDA GHG Inventory for Agriculture and Forestry




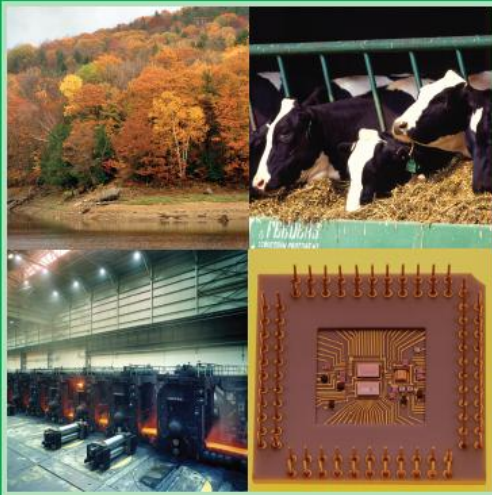
1. Provides data at multiple scales (by region, state, ownership, livestock, crops, etc.)
2. Identifies opportunities to reduce emissions and enhance sinks
3. Provides specific information for landowners and technical service providers
4. Identifies key uncertainties and priorities for improving emissions estimates
5. Updated every 2 years

Contributors:

- USDA Forest Service
- USDA Agricultural Research Service
- USDA Natural Resources Conservation Service
- USDA Office of Energy Policy and New Uses
- US Environmental Protection Agency
- Colorado State University

USEPA GHG Inventory

 EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2007



1. USDA provides data, analysis and documentation for the land use, land use change and forestry chapter.
2. USDA provides statistical and quantitative data for the agricultural lands.
3. Updated every year

DOE GHG Reporting Guidelines



1. USDA prepared the only comprehensive set of GHG inventory methods for U.S. projects and entities for the Department of Energy's 1605(b) Program.
 - The program provided two sets of methods:
 - GHG inventory guidelines (GHG footprints)
 - Methods for estimating GHG reductions
2. USDA provided detailed new guidelines for forestry and agriculture.



New USDA Guidelines for Farm or Entity GHG Reporting

- USDA is embarking on a new effort to create a “stand alone” set of GHG inventory guidelines and tools that build upon previous inventory efforts and the 1605(b) guidelines.
 - Focusing on developing user interfaces and improved calculation tools
 - Prioritizes research needs to reduce inventory uncertainty, esp:
 - N₂O from fertilizer use
 - Manure management systems
 - Intermediate forest management treatments
 - Carbon storage in soils for a broader range of cropping systems
 - Building upon current inventory and modeling techniques, taking an integrative approach.



New USDA Guidelines for Entity/Project GHG Reporting

The guidelines will result in a method for an integrated inventory at the entity scale for all agricultural and forest management activities:

- Cropland Soils
- Agroforestry
- Enteric fermentation
- Field residue burning
- Rice production
- Grazing land management
- Fertilizer management
- Forest management
- Manure management
- Lime applications
- Wetland soils



The Guidelines and Methods will:

- Build upon the 1605(b) guidelines, providing a simpler, more robust reporting tool.
- Integrate use of existing modeling tools (such as COMET-VR, COLE, FVS, etc.) as much as possible in order to maximize data and reporting consistency and transparency.
- Be scalable for use in local and regional estimation, and consistent with national inventory efforts.
- Be multi-purpose to facilitate use by:
 - Private landowners
 - Public and private GHG registries
 - USDA for assessing the effectiveness of conservation programs
 - Policy-makers in debating/implementing possible legislative options
- Pass full expert peer and public reviews.
- Provide reliable, real and verifiable estimates of on-site GHG emissions and C storage.

The project is planned for completion within the next three years.

The Challenge:

Make the Guidelines Scientifically Valid, yet
Easy to Understand and Easy to Use

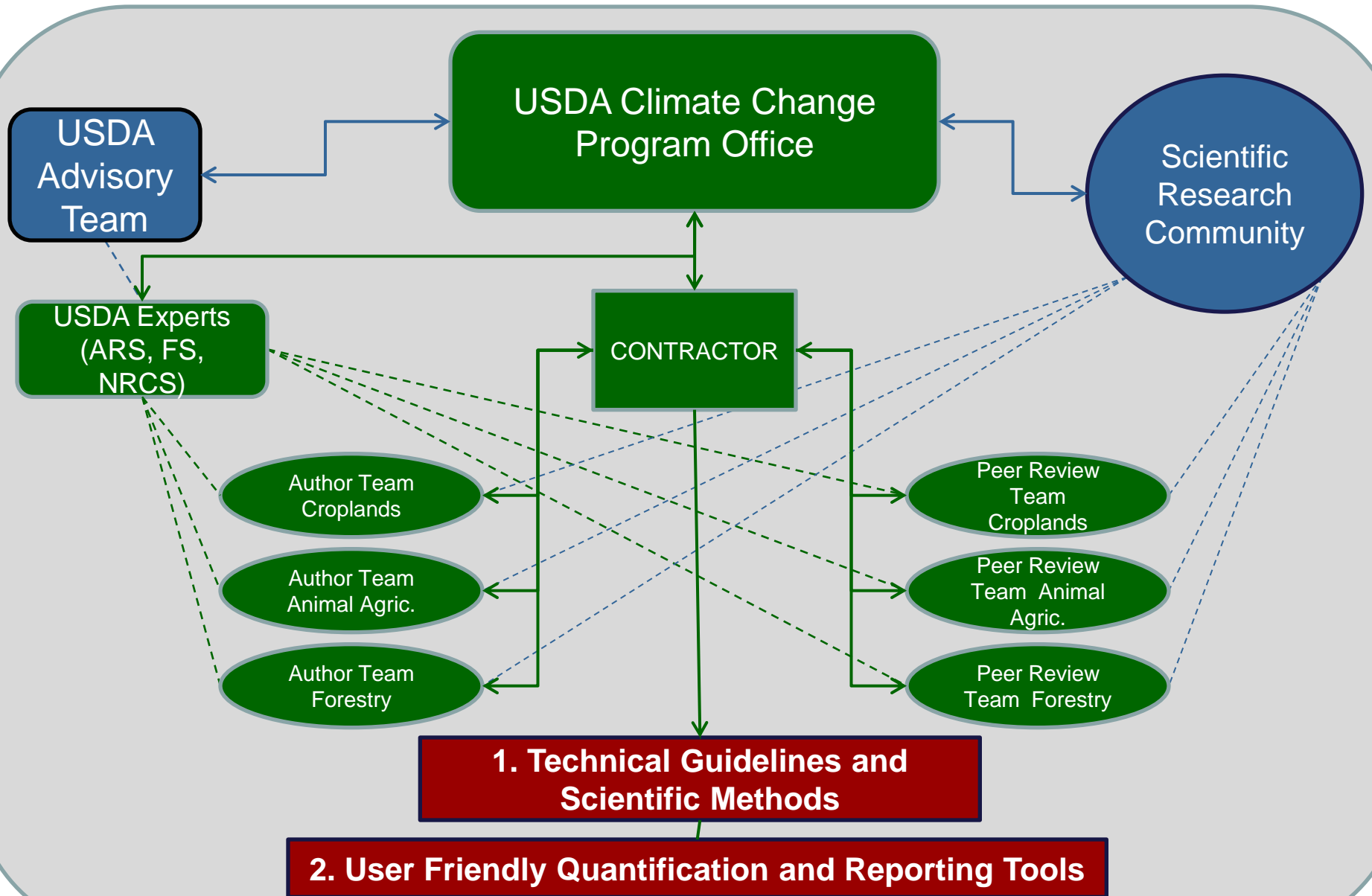
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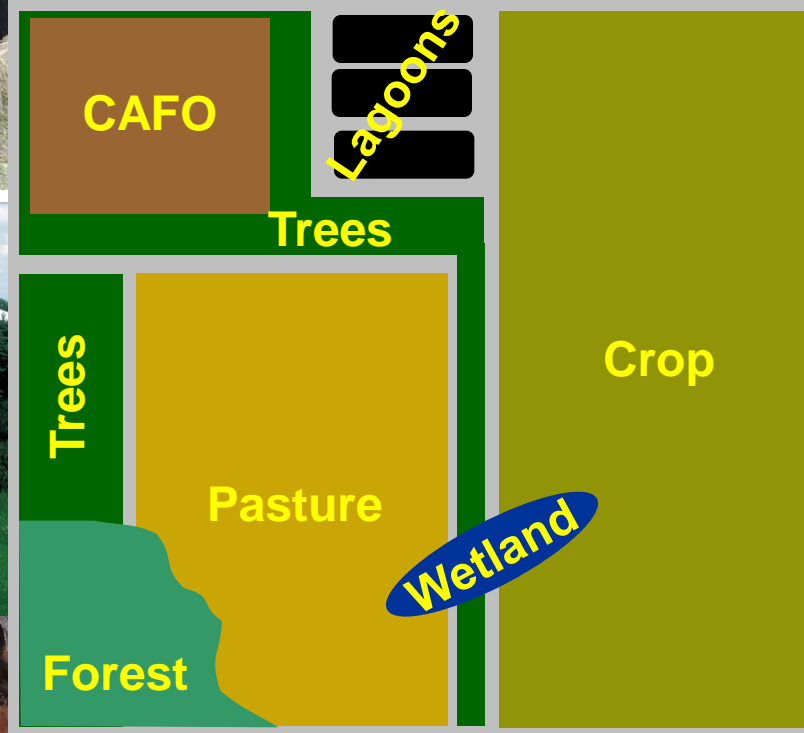
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USDA GHG Guidelines Development



The entity - combining a landowner's crop, livestock and forestry activities into one seamless estimate and report.



Practices and Technologies

CROPLAND AGRICULTURE



- Conservation tillage (changes in equipment or reduced field pass intensity);
- Crop diversity (rotations, cover cropping, continuous cropping, and reducing dry land fallow);
- Efficient nutrient management (timing, type, method, rate, and nitrogen inhibitors);
- Improved nitrogen fertilizer use efficiency;
- Improved irrigation strategies for rice paddies (reducing frequency and duration of flooding);
- Improved management of organic soils to reduce emissions;

Practices and Technologies

ANIMAL AGRICULTURE



- Improved management of manure and effluent to reduce greenhouse gas emissions;
- Implementation of anaerobic digesters;
- Improved animal management practices, including dietary modifications;
- Improved grassland management (fertility, conservation, grazing intensity and rotational grazing).

Practices and Technologies

FORESTS



- Afforestation or reforestation of acreage that is not forested;
- Conservation of forested land;
- Improved forest management (rapid re-establishment of stands, proper stocking, reduced impact logging, productivity improvements, rotation ages, tinning, fire risk reduction);
- Carbon storage in wood products;
- Rehabilitating degraded lands.
- Agro-forestry

KEY CONSIDERATIONS

1. How to improve accuracy while also enhancing ease of use?
2. How to make the Guidelines most broadly useful to a diverse set of Agencies and stakeholders?
3. How to quantify GHGs for the whole operation – are there “minor activities” or does the estimate need to capture ALL activities within the entity?
4. Should the guidelines specify ONE method for any given activity, or allow users a menu of methods requiring differing levels of input detail?
5. How to balance scientific rigor while maintaining broad applicability, national consistency and user friendliness?
6. What models or tools currently exist for farm- or entity-scale GHG inventory and reporting and how might they be useful to this project?
7. What considerations in the Guidelines could specifically lead to lower cost of verification or validation of offsets under a crediting system?



KEY CRITERIA

1. **Transparency** – Assumptions and methodologies clearly explained to facilitate replication.
2. **Consistency** – The methods and estimates should be internally consistent with other years and, to the extent possible, with other USDA inventory efforts.
3. **Comparability** – Requires that the estimates of emissions and sequestration reported by one entity be comparable to the estimates being reported by others.
4. **Completeness** – An inventory must account for all sources and sinks, as well as all greenhouse gases to the greatest extent possible.
5. **Accuracy** – Estimates should be accurate in that they are systematically neither over nor under true emissions or removals as far as can be judged.
6. **Cost effectiveness** – Balance between the relative costs and benefits of additional efforts to improve the inventory or reduce uncertainty.
7. **Ease of use** – The level of complexity of the user interface and underlying data requirements.





PROJECT TIMELINE



- ❖ Project Planning
- ❖ RFP Development
- ❖ Contractor Selection



- ❖ Author Panels Selected
- ❖ Public comment and input
- ❖ Guidelines 1st Draft
- ❖ USDA Review
- ❖ Technical Peer Review



- ❖ Completion of 2nd Draft
- ❖ Development of Tool and Interface 1st Draft
- ❖ USDA Tool Review
- ❖ Completion of 3rd Draft Guidelines and 2nd Draft Tool



- ❖ Tool Beta Testing
- ❖ Guidelines Public Comment
- ❖ Tool Public Comment
- ❖ Final Guidelines Published
- ❖ Final Tool and Documentation Published



Project information will be posted
as it becomes available at:

www.usda.gov/oce/climate_change/techguide

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