FAIR Data Sharing in the Climate Context: A Stakeholder Perspective

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April 20, 2023

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Data Sharing Needs in the Climate Context

- New data collection and sharing mechanisms that adhere to FAIR principles are needed in the climate context.
- Macro, economy-wide data is no longer enough. Strong activity-level and verified climate data are needed to guide corporate and governmental policy and funding decisions. The stakes are high.
- The need for effective FAIR data sharing mechanisms is acute as significant new climate-related data will be generated in the next few years in the U.S., and globally.

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Data Sharing Needs in the Climate Context

Background:

- EPA National Greenhouse Gas Inventory (annual report of U.S. GHG emissions and sinks, per framework climate convention) is solid in sectors for which data reporting is required.

- In traditionally unregulated GHG sectors, national GHG inventory data are poor, with large uncertainty bands (e.g., agriculture, forestry and other land-based emissions sources and sinks; methane sources in oil & gas, landfill, and ag sectors). Activity-level data are often either missing, or based on unverified model-based assumptions.

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Data Sharing Needs in the Climate Context

- Governmental and private parties are/will be making major investments in collecting GHG data in some of these data-poor sectors for a variety of reasons including:
  - Feds, states and cities need to track progress against climate goals.
  - New oil & gas regulations will require testing for methane in oil & gas industry. Major gov't and other stakeholder focus on other methane sources (e.g., agriculture, landfills, wastewater).
  - New MMRV investments will made for "climate-smart" agricultural and forestry practices, per Administration and Congressional direction/funding.

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NASEM GHG Data Framework Report

NASEM Report: “GHG Emissions Information for Decision Making: A Framework for Going Forward” (COP26--2022)

- “Enhanced characterization and quantification of the sources, sinks and related processes affecting GHG emissions . . . is fundamental to understanding climate change and the policy responses taken by decision makers.”

- Need to combine “activity-based” and “atmospheric-based” approaches; bottom up/top down. Hybrid approaches are ideal. Seek to align GHG emission information with 6 “pillars”: Usability & timeliness; transparency; evaluation/validation; completeness; inclusivity; communication.

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NASEM GHG Data Framework Report

- Need to develop a “coordinated [GHG data] repository or federation of repositories” across the global community, enabling adherence to a set of minimum common pillar attributes.

- A federated data center/clearinghouse could establish standards and practices, aligned with the pillars.

- “Focused…gov’t purchases aimed at bringing data and methods into the public domain with standards on transparency and open principles (e.g., FAIR data principles [findable, accessible, interoperable, and reusable]) could have substantial near-term impact on the utility of GHG emissions information.”

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Draft Fed Strategy to Advance GHG Monitoring & Information System

- Following White House completion of Nationally Determined Contribution, the White House formed a GHG Measurement & Monitoring Interagency Working Group (IWG), co-chaired by the WH Climate Policy Office; OSTP; OMB.

- The IWG/NASA released a Draft "Federal Strategy to Advance an Integrated U.S. GHG Monitoring & Information System" in the March 2, 2023 Federal Register. Comments were due on April 4. Additional draft paper on agriculture and forestry will follow.

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Draft Fed Strategy to Advance GHG Monitoring & Information System

- U.S. needs an "Integrated U.S. GHG Monitoring & Information System that takes advantage of advanced measurement and modeling capabilities, as well as the growth of GHG observational data, to produce enhanced data products." Emissions/removals from natural sources must be included.

- "A coordinated approach that brings together Federal, subnational, commercial, philanthropic, and academic capabilities would significantly accelerate the Nation's progress towards an integrated GHG monitoring and information systems that supports the Administration's GHG reduction goals and mitigation efforts at the local and regional level."

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Draft Fed Strategy to Advance GHG Monitoring & Information System

- "The System will integrate Federal and non-Federal data and reflect transparency in both data and methods…[Data and methods] will be scientifically-validated, include uncertainty quantification and support data quality sufficient to drive accurate emissions estimates and removal amounts determined at the same location and time via independent methods….meet[ing] user needs for actionable GHG emissions information.

- Atmospheric- and activity-based approaches; bottom up/top down.

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Draft Fed Strategy to Advance GHG Monitoring & Information System

- Need an "information repository" that adheres to accessibility, transparency and data quality principles and integrates existing data using FAIR principles."
- Agencies will jointly develop a plan that brings together data sources.
- "To better integrate and increase the accessibility of GHG data from various sources, the federal gov't will need to more clearly define agency roles and responsibilities and put in place a governance framework for conducting this work."

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Stronger GHG Data Integrity/Availability is Needed in the Agriculture Sector

Measuring, monitoring, reporting & verification (MMRV) of agricultural GHG fluxes is limited. . .	. . . due to the heterogeneity of ag soils, inaccessibility of USDA-sponsored soil data and near-complete lack of attention to methane & N2O.
But ESG pressures and potential market rewards are putting focus on climate and sustainability practices across supply chains . . .	. . . so major agricultural producers and retailers are turning to their farmer-suppliers, looking to promote such practices.
Voluntary carbon markets are already one such market reward, generating carbon offset payments for "climate-smart," regenerative ag practices . . .	. . . yet MMRV supporting these voluntary carbon markets is limited and opaque; markets are unregulated; increasing prevalence of proprietary data collection and software tools.

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New Ag Funding/Authority Calls for Stronger GHG Data Integrity

Inflation Reduction Act

$19+B Funding

Allocated to existing USDA conservation programs subject to the USDA Secretary's data-informed confirmation of climate benefits.

$300M of the IRA funding is explicitly dedicated for MMRV.

USDA "Partnerships for Climate-Smart Commodities"

$3+B Program

Tests proposition that farmers who produce commodities using "climate-smart" practices can sell products at higher prices.

Will generate significant new GHG data, including some produced through innovative technologies/methodologies. Will these data be accessible?

2023 Omnibus Budget

Requires that USDA identify "widely accepted protocols" and "sampling methodologies" to ensure "programmatic integrity" of voluntary carbon markets.

GHG Data Needs for the Agriculture Sector

Stanford report on "Data Advances Needed for Climate Smart Agriculture" released on April 19, 2023.

https://law.stanford.edu/publications/data-progress-needed-for-climate-smart-agriculture/

Key themes:

- Current GHG ag data/modeling are inadequate
- USDA has a historic opportunity to improve GHG accounting
- Priority should be given to methane & nitrous oxide emissions
- USDA should establish a Climate-Smart Ag Protocol Clearinghouse

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GHG Data Needs for the Agriculture Sector

USDA Should:

- Establish an **Agriculture GHG Data Management System** that will collect and organize GHG measurement and monitoring data in accessible anonymized formats to facilitate public review, analysis, and benchmarking of agriculture measurement and monitoring protocols. The Agriculture GHG Data Management System will implement the goals of White House's proposed "Federal Strategy to Advance an Integrated U.S. Greenhouse Gas Monitoring & Information System" for the agricultural sector.

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GHG Data Needs for the Agriculture Sector

- Work with the White House GHG Measurement and Monitoring Working Group, the U.S. Digital Service, and philanthropic partners to evaluate options for how to structure the Agriculture GHG Data Management System, how to administer it (including, potentially, through a quasi- or non-governmental entity in partnership with the federal government), how to ensure that data is anonymized to protect farmer privacy interests, and how to establish ground rules for data submission to maximize the data's interoperability with other agricultural datasets.

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Next Up

- White House GHG Interagency Working Group will finalize draft GHG Measurement & Information System document & release Agriculture & Forestry-related proposal.

- Stanford Report on Climate-Smart Forestry will be released by mid-June.

- On-going work with the White House, USDA, Philanthropy (Bezos Earth Fund) and others to push for a Agriculture GHG Data Management System that follows FAIR principles.