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STANDARDS AND TECHNOLOGY  
U.S. DEPARTMENT OF COMMERCE



# The U.S. Greenhouse Gas Center (US GHG Center)

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*With input from the interagency Technical Expert Group*



# Motivation for prototyping the U.S. GHG Center

- U.S. has pledged to reduce nationwide GHG emissions by 50% by 2030 and achieve net-zero emissions by 2050.
  - Immediate, whole-of-society approach, including public, private and philanthropic actors
- Urgent need to distribute robust GHG data, scale up advances from federal research and coordinate GHG monitoring across sectors to:
  - Support implementation of the **national GHGMIS Strategy**
  - **Track progress** towards GHG emission targets
  - Improve accessibility, usability and integration of **trusted GHG data needed by users**
  - Leverage multiple vantage points and **integrate results** through models to create products for community use
  - **Foster collaboration** and coordinate U.S. contributions to interagency and international initiatives.

## NATIONAL STRATEGY TO ADVANCE AN INTEGRATED U.S. GREENHOUSE GAS MEASUREMENT, MONITORING, AND INFORMATION SYSTEM

A REPORT BY THE GREENHOUSE GAS MONITORING AND  
MEASUREMENT INTERAGENCY WORKING GROUP

NOVEMBER 2023



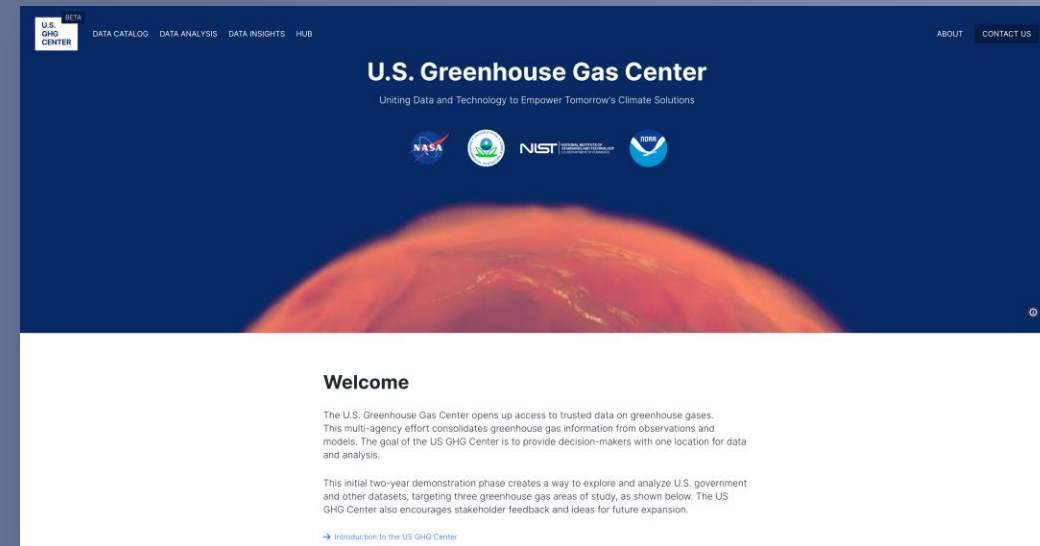
# The US GHG Center

## VISION

Inspire and accelerate the use of Earth science data and information to increase confidence in setting, assessing, and meeting climate mitigation goals.

## MISSION

Extend accessible and integrated GHG data and modeling capabilities from U.S. Government and non-public sources for scalable impact.



[earth.gov/ghgcenter](https://earth.gov/ghgcenter)

## ❖ The U.S. GHG Center: What is it?

The US GHG Center is a multi-agency effort to facilitate coordination across federal and non-federal, domestic and international entities to integrate and enhance GHG data and modeling capabilities for scalable impact. It supports implementation of the National Strategy – supporting near-term activities to make GHG information more accessible and valuable for USG and non-USG users, while putting in place planning and capabilities for future enhancements and sustained use.

- 2-year demonstration phase
- Implementing partners: NASA, EPA, NOAA, NIST. Coordinated by the Technical Expert Group (TEG)
- Iterative approach to integrate additional Federal and non-Federal capabilities in the future

## ❖ Examples of Agency Capabilities

- NASA — Satellite Observations of GHGs, data system, management of U.S. GHG Center, stakeholder engagement
- EPA — anthropogenic GHG emissions
- NOAA — Global reference network for monitoring GHGs including aircraft measurements, data and information services and provision of WMO calibration standards
- NIST — Measurement Science and Technologies supporting standards and standardization; urban emissions
- Multi-agency — models to understand global systems informed by observations across government, collaboration on airborne campaigns



Data, Modeling Capabilities and Needs from Partner Agencies\*

U.S. GHG CENTER  
earth.gov/ghgcenter



### Observations

### Modeling

### GHG Data and Information System

#### Research & Applications

- Leverages ESDS/VEDA capabilities
- Test bedding of modeling, integration approaches
- Standards & processes for thorough evaluation of new observations before transition
- Advanced users

#### End User System (Front End)

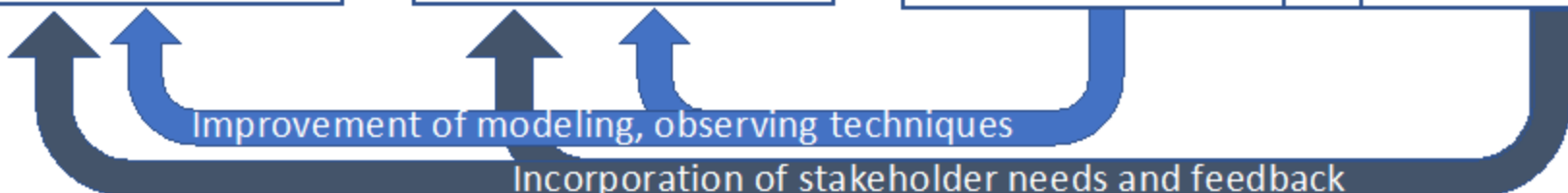
- Leverages ESDS/VEDA
- Public-facing
- Curated, mature products representing consensus view
- Science and non-science users
- Enhanced help desk support

### Focus Areas

#### Gridded Anthropogenic Emissions

#### Natural GHG Emissions

#### Detecting and Tracking High Emission Events



\* List of implementing partners, with expectation to integrate additional Federal & non-Federal capabilities.

# U.S. Greenhouse Gas Center

Uniting Data and Technology to Empower Tomorrow's Climate Solutions



## Welcome

The U.S. Greenhouse Gas Center opens up access to trusted data on greenhouse gases. This multi-agency effort consolidates greenhouse gas information from observations and models. The goal of the US GHG Center is to provide decision-makers with one location for data and analysis.

This initial two-year demonstration phase creates a way to explore and analyze U.S. government and other datasets, targeting three greenhouse gas areas of study, as shown below. The US GHG Center also encourages stakeholder feedback and ideas for future expansion.

[→ Introduction to the US GHG Center](#)

# Initial Focus Areas

[→ Introduction to the US GHG Center](#)



### Gridded Anthropogenic Greenhouse Gas Emissions

Emission estimates from human activities including the energy, agriculture, waste, and industry sectors

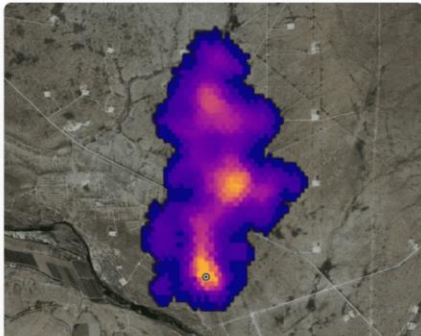
[→ Check out relevant datasets](#)



### Natural Greenhouse Gas Sources and Sinks

Naturally-occurring greenhouse gas fluxes from land, ocean, and atmosphere

[→ Check out relevant datasets](#)



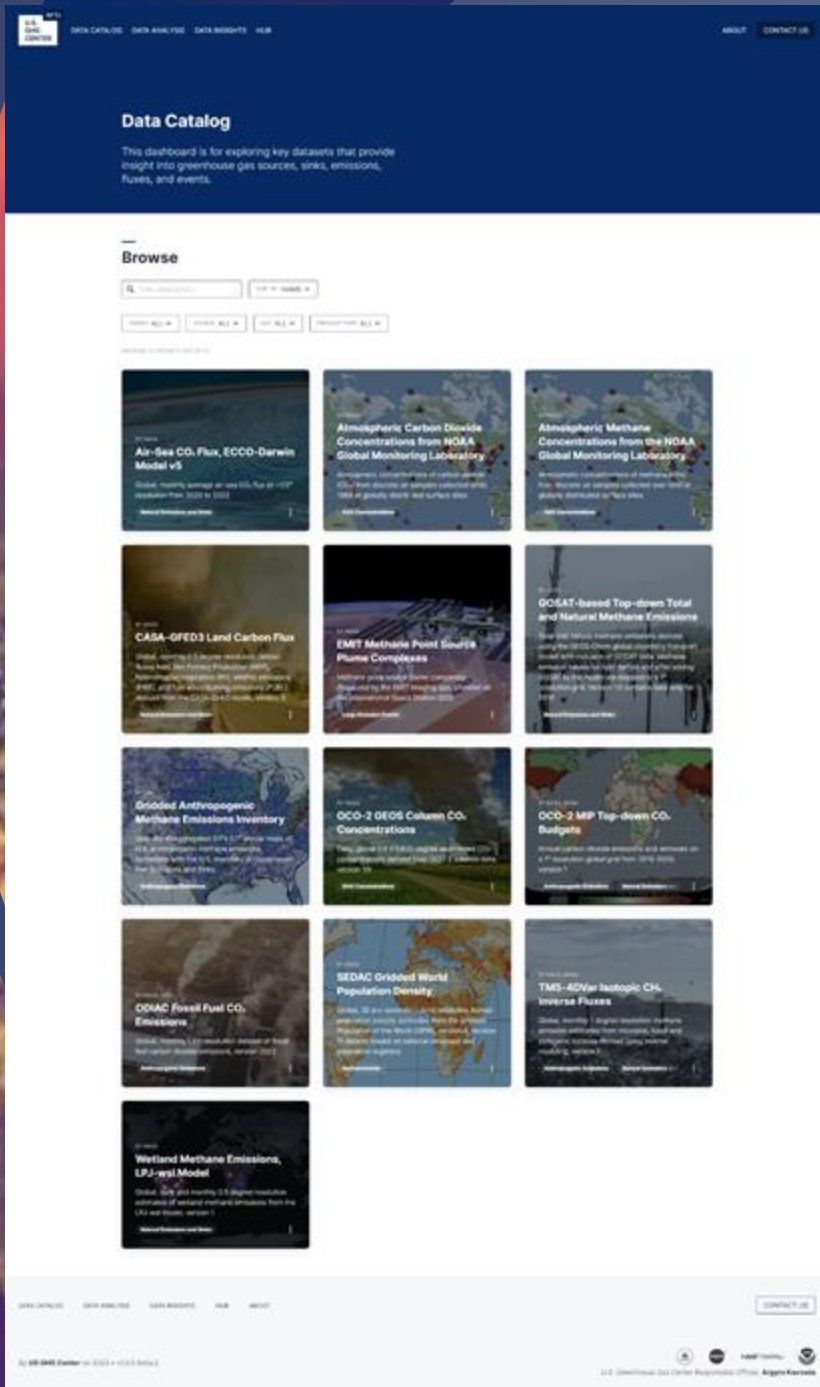
### New Observations for Tracking Large Emission Events

Identify and quantify large methane leak events leveraging aircraft and space-based data

[→ Check out relevant datasets](#)

[BROWSE THE DATA CATALOG →](#)





Dataset Name	Source	Focus Areas
Gridded Anthropogenic Methane Emissions Inventory	EPA	1
ODIAC Fossil Fuel CO <sub>2</sub> Emissions	NASA/NIES	1
Atmospheric Carbon Dioxide Concentrations from the NOAA Global Monitoring Laboratory	NOAA	1 & 2
Atmospheric Methane Concentrations from the NOAA Global Monitoring Laboratory	NOAA	1 & 2
Wetland Methane Emissions, LPJ-wsl Model	NASA	2
CASA-GFED3 Land Carbon Flux	NASA	2
OCO-2 MIP Top-down CO <sub>2</sub> Budget	NASA/NOAA	2
GOSAT-based Top-down Total and Natural Methane Emissions	NASA	2
OCO-2 GEOS Column CO <sub>2</sub> Concentrations	NASA	2
Air-Sea CO <sub>2</sub> Flux, ECCO-Darwin Model v5	NASA	2
TM5-4DVar Isotopic CH <sub>4</sub> Inverse Fluxes	NASA/NOAA	2
EMIT Methane Point Source Plume Complexes	NASA	3
SEDAC Gridded World Population Density	NASA	Socioeconomic



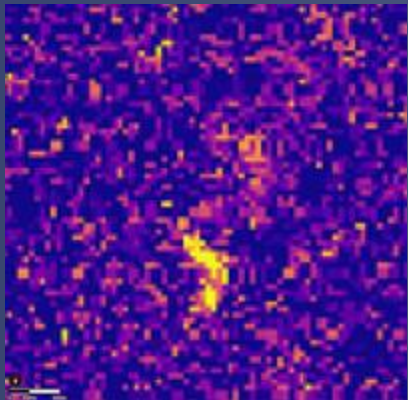
# Focus Area 3 – New Observations to Track Large Emission Events

## EMIT and AVIRIS-3 CH<sub>4</sub> measurements

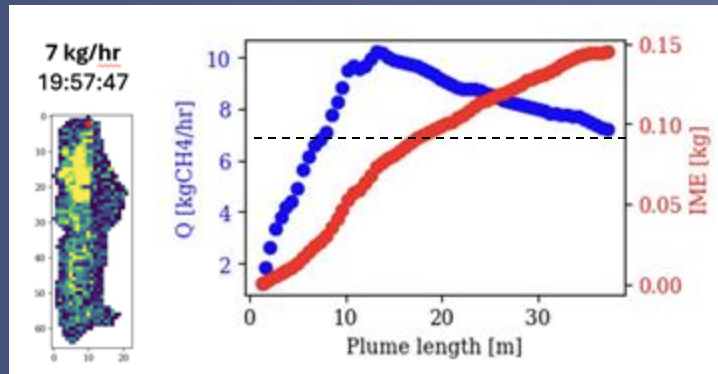
US GHG Center features >1000 EMIT CH<sub>4</sub> plume complexes



Coincident EMIT and AVIRIS-3 CH<sub>4</sub> cal/val



AVIRIS-3 CH<sub>4</sub> controlled release experiment



## Milestones/deliverables

- EMIT L2B CH<sub>4</sub> plume imagery (ongoing deliveries to LP DAAC)
- Documented code: <https://github.com/emit-sds/emit-ghg>
- Algorithm Theoretical Basis Document: [https://lpdaac.usgs.gov/documents/1696/EMIT\\_GHG\\_ATBD\\_V1.pdf](https://lpdaac.usgs.gov/documents/1696/EMIT_GHG_ATBD_V1.pdf)
- Calibration/validation airborne AVIRIS-3 flights

## Stakeholder engagement

- State Department shared EMIT CH<sub>4</sub> plumes with Turkmenistan, which contributed to joining Global Methane Pledge
- EMIT and AVIRIS-3 CH<sub>4</sub> results shared with New Mexico Environment Department

# Research Opportunity – NASA ROSES 2024

## ❖ **A.58 Increasing Participation of Minority Serving Institutions in Earth Science Surface-Based Measurement Networks ([link](#))**

- ❖ Expected annual program budget for new awards ~ \$1.5 M/yr
- ❖ Number of awards anticipated ~ 10 institutions/ instruments
- ❖ Maximum duration of awards 5 years
- ❖ Web site for submission of proposal via NSPIRES  
<http://nspires.nasaprs.com>
- ❖ Web site for submission of proposal via Grants.gov  
<https://www.grants.gov/>
- ❖ **Close Date: May 20, 2024**

# US GHG Center Stakeholders

*Partner: An organization that actively co-develops the capability to achieve sustained use and sustained benefit from greenhouse gas observations and modeling for the US GHG Center.*

## Implementing Partners



## Discussions with Stakeholders \*



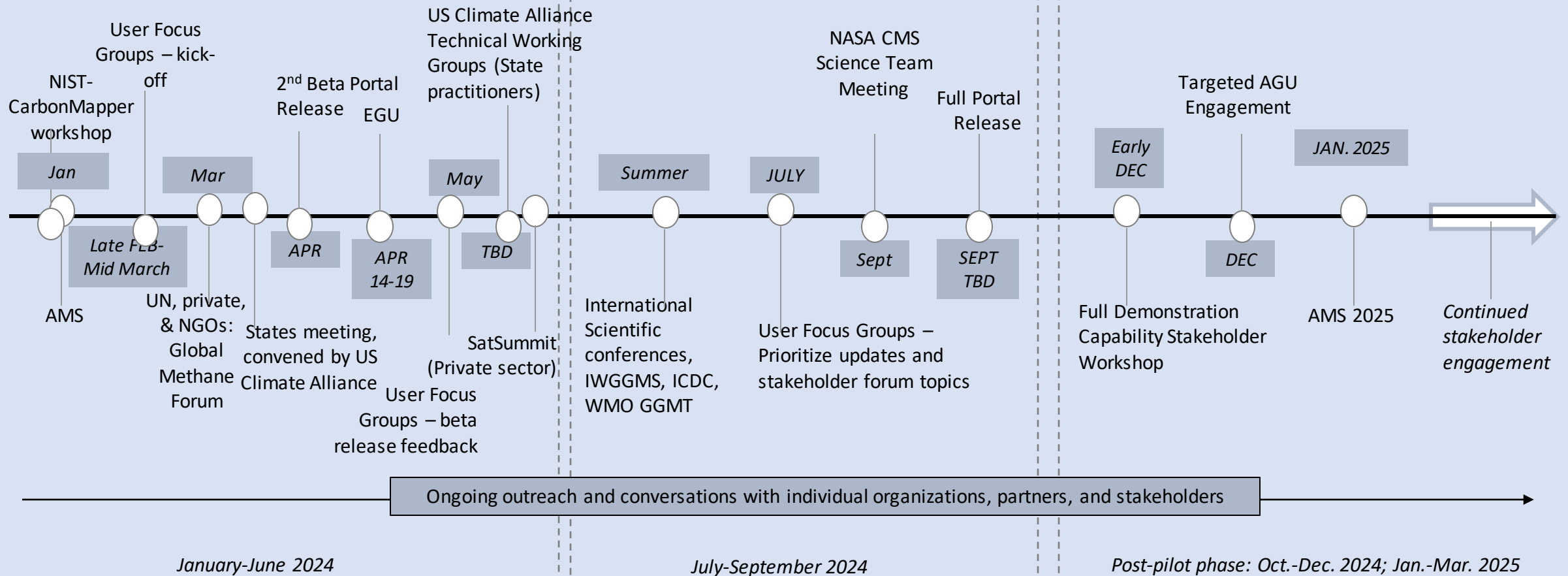
## Future targeted engagement\*



*\*Representative examples*



# Draft Stakeholder Engagement Timeline



# User Focus Groups



- **Purpose:** 2-way engagement with US GHG Center users interested in co-developing and enhancing the three (3) focus areas capabilities.
- **Who:** Existing and potential users of US GHG Center capabilities from the USG and non-USG space with interest in one or more initial focus areas.
- **What:** Users sign up to communicate with the US GHG Center related to providing feedback on existing capabilities and proposing enhancement requests. Users will also be contacted to solicit thoughts on periodic portal and capability updates, and support prioritization of new capability requests.
- **How:** US GHG Center - led community emails, direct questions for feedback, newsletters and announcements, website feedback forms, and bi-monthly virtual meetings/webinars.
- **When:** 2hr meetings in 2024, Feb/Mar, May/June, July/Aug, October/Nov
  - Feb 28 3-5pm EST (Focus Area 2);
  - March 6 3-5pm (Focus Area 1);
  - March 11 3-5pm (Focus Area 3)

Focus Area 1: Anthropogenic	64
Focus Area 2: Natural Sources	68
Focus Area 3: Large Events	72

# Looking Ahead



- ❖ Developing mechanisms to solicit input and work with partners and stakeholders to refine or add new capabilities
- ❖ Co-developing criteria, review and integration process for US GHG Center enhancements
- ❖ Developing interagency data inclusion strategy
- ❖ Developing decision support tools
- ❖ Supporting implementation of the national GHG strategy
- ❖ Links to international efforts





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**Thank you**

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