MAIRE25 Data Management Plan

Updated: August 6, 2025

Project Description

Field Phase Dates: September 15, 2025 - October 3, 2025
Location: Austin, TX
Funding: NSF

Participants:

Harvard Group Principal Investigators (PIs): Steve Wofsy, Jasna Pittman
NCAR/EOL Project Managers: Peisang Tsai, Cory Wolff
NCAR/EOL/Data Management & Services (DMS): Carol Ruchti
NCAR/EOL/Research Aircraft Facility (RAF) Data Management: Sara Runkel
Project Pilots: Bo LeMay, Edward Proulx, Stephen Jude, Missy Martin, Joe LoRusso
Instrument Software Support: Catherine Dewerd (NCAR/EOL/RAF)
Operation Center: Mike Paxton (NCAR/EOL)
Documentation & Certification Requirements (Electrical): Kurt Zrubek, Kyle Holden (NCAR/EOL)
Documentation & Certification Requirements (Structural): Kurt Zrubek (NCAR/EOL)
Payload Configuration: Bruce Daube
Mission Design: Maryann Sargent

The MAIRE25 (Methane Emissions Quantification at scales from 20 m to 200 km using the MethaneAIR Imaging Spectrometer on the NSF Gulfstream-V) is the 2025 extension to the MAIRE24, MethaneAIR, and MAIR-E field projects. MethaneAIR is an airborne imaging spectrometer and is the precursor to the MethaneSAT project. The NSF/NCAR GV HIAPER aircraft will have two, wide-swath, high-resolution imaging spectrometers that generate hundreds of GB of data on each flight (frames are acquired at 10 Hz, each roughly 1000 spatial pixels across track and 800 spectral pixels, for each of two spectrometers). The first scientific goal is to comprehensively measure emissions from oil and gas provinces to define and track this major contribution to the rise of this greenhouse gas and pollutant in the global atmosphere. The secondary objective is to quantify landfill emissions within or near our planned oil and gas target regions to explore the effectiveness of methane capture technology. A more detailed description of the MAIRE25, MAIRE24, MAIR-E and the MethaneAIR projects can be found on the EOL MAIRE25 Project website, EOL MAIRE24 Project website, EOL MAIR-E Project website and EOL MethaneAIR Project website, respectively.

General Data Management

1. All project participants agree to follow the MAIRE25 Data Policy and the MAIRE25 Data Management Plan (this document).
2. All EOL platform and instrument datasets will follow the EOL Data Policy including timely release of quality controlled EOL data and metadata plus full and open sharing of all EOL datasets with the scientific community and public. No requests for additional restrictions of EOL datasets were submitted to the EOL Directorate for MAIRE25.
3. All datasets submitted to the NCAR EOL MAIRE25 Data Archive will be accompanied by the required Dataset Documentation and metadata.
4. Any photographs submitted to the NCAR EOL MAIRE25 Data Archive or that are to be displayed on the EOL MAIRE25 project website must include written permission from all people shown in the photographs.

Data Archival

1. Data will be archived in the formats specified by the project PIs.
2. Raw, L0, and L1 airborne imaging spectrometer data will be managed by and only available from the PI Group. Raw, L0, and L1 data will not be included in the NCAR EOL MAIRE25 Data Archive.
3. NCAR EOL will manage and ensure online ordering via the NCAR EOL MAIRE25 Data Archive for the following datasets:
    a. Level 2 and other processed airborne imaging spectrometer datasets, as requested by the project PIs (the availability of Raw, L0, L1 data from the PI Group will be included in the dataset description) (DMS)
    b. RAF platform datasets (RAF)
    c. PI requested supporting datasets (DMS)

The list of the datasets to be included in the NCAR EOL MAIRE25 Data Archive can be found in the MAIRE25 Dataset List on the EOL MAIRE25 Project webpage. Data submission instructions for the post-field phase can be found on the MAIRE25 Post-Field Phase Data Submission Instructions page.

Near Real-Time Data Collection

Near real-time data collection and transmission of MethaneAIR data from the NSF/NCAR GV HIAPER aircraft will be handled by the PI team. A member of the PI group will be responsible for managing and archiving raw MAIR-E data. The data upload location while in Austin, TX has not been finalized. As of this writing, it appears there may be a space at the University that the PIs can use. The continued availability of acceptable data upload speeds (dedicated upload bandwidth of 150 Mbps) will be confirmed by the PI team.

RAF will generate Low Rate (1 Hz) and High Rate (25 Hz) flight level data in netCDF format, as well as flight tracks in KML format, immediately following each flight. This data will be generated

on the RAF Ground Station, a data processing computer, while operating at NCAR RAF in Broomfield, CO, and the field location in Austin, TX. These data files will be available via sftp or from a website set up specifically for MAIRE25 that is shared with the PI team. Team members will need to request the credentials to the sftp and the website from the RAF SE team (rafse@ucar.edu). After the field phase, these LRT, HRT, and KML data will be made available via the NCAR EOL MAIRE25 Data Archive, and the data sharing website will be shut down. Final versions of EOL-generated aircraft datasets will be made available in the NCAR EOL MAIRE25 Data Archive as specified in the MAIRE25 Data Policy.

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