

Data Intake Processing and Verification Report

Background Information

- **Original Dataset Name:**
 - NOAA Global Greenhouse Gas Reference Network Continuous Insitu Measurements of CO₂, CH₄, and CO at Global Background Sites, 1973-Present
 - Earth System Research Laboratory Carbon Cycle and Greenhouse Gases Group Continuous Measurements of CO₂, CO, and CH₄ from Tall Towers, 1992-Present
 - NOAA Global Greenhouse Gas Reference Network Flask-Air Sample Measurements of CO₂, CH₄, CO, N₂O, H₂, SF₆ and isotopic ratios at Global and Regional Background Sites, 1967-Present
 - NOAA Global Greenhouse Gas Reference Network Flask-Air PFP Sample Measurements of CO₂, CH₄, CO, N₂O, H₂, SF₆ and isotopic ratios of carbon and oxygen at Tall Tower and other Continental Surface Sites, 2005-Present
 - Trends in Atmospheric Carbon Dioxide (CO₂), Mauna Loa CO₂ daily means
- **GHG Center Dataset Title:** Atmospheric Carbon Dioxide Concentrations from NOAA Global Monitoring Laboratory
- **Dataset Provider:** NOAA
- **Date Obtained:** August 2024
- **Location Obtained From:**
 - https://gml.noaa.gov/aftp/data/greenhouse_gases/co2/in-situ/surface/co2_surface-insitu_ccgg_text.zip
 - https://gml.noaa.gov/aftp/data/greenhouse_gases/co2/in-situ/tower/co2_tower-insitu_ccgg_text.zip
 - https://gml.noaa.gov/aftp/data/greenhouse_gases/co2/flask/surface/co2_surface-flask_ccgg_text.zip (event.txt files only)
 - https://gml.noaa.gov/aftp/data/greenhouse_gases/co2/pfp/surface/co2_surface-pfp_ccgg_text.zip (event.txt files only)
 - https://gml.noaa.gov/webdata/ccgg/trends/co2/co2_daily_mlo.txt
- **Data Location in GHG Center:** noaa-gggrn-co2-concentrations
- **Data POC(s):** Dr. John Miller, Dr. Arlyn Andrews
- **Dataset File Type(s):** Text (.txt)
- **Projection (if different from WGS84):** N/A

Data Intake Process

- https://us-ghg-center.github.io/ghgc-docs/data_workflow/noaa-gggrn-co2-concentrations_Data_Flow.html

Confirmation of Successful Data Transfer & Processing

All quality controlled data are read directly from NOAA's data repository

(https://gml.noaa.gov/aftp/data/greenhouse_gases/co2). Due to the shortness of record or

complexity of interpretation, the following Surface PFP sites ([co2_surface-pfp_ccgg_text](#)) have been excluded: LAC, INX, BWD, NEB, NWB, TMD, SPF, KLM, MKO, MLO, HFM. Near Real Time (NRT) data for the Mauna Loa Observatory (MLO) are read from this file: https://gml.noaa.gov/webdata/ccgg/trends/co2/co2_daily_mlo.txt. NRT data is only shown for dates where quality controlled data are not yet available.

For the tower data ([/in-situ/tower/co2_tower-insitu_ccgg_text](#)), hourly measurements were aggregated into daily and monthly averages for display in the US GHG Center. Validation for the hourly to daily & monthly averages are shown below:

The surface Insitu dataset from the BRW station was taken as a ground truth, as it had all three data frequencies (hourly, daily, and monthly). The hourly dataset of the same BRW station was then selected as a sample. After that, the aggregator script (using mean/average aggregation) was used on the sample dataset, which generated the daily and monthly average (aggregated) data. Finally, the results were tested against the ground truth which concludes the following results:

1. The ground truth daily Insitu data versus the daily average Insitu data:

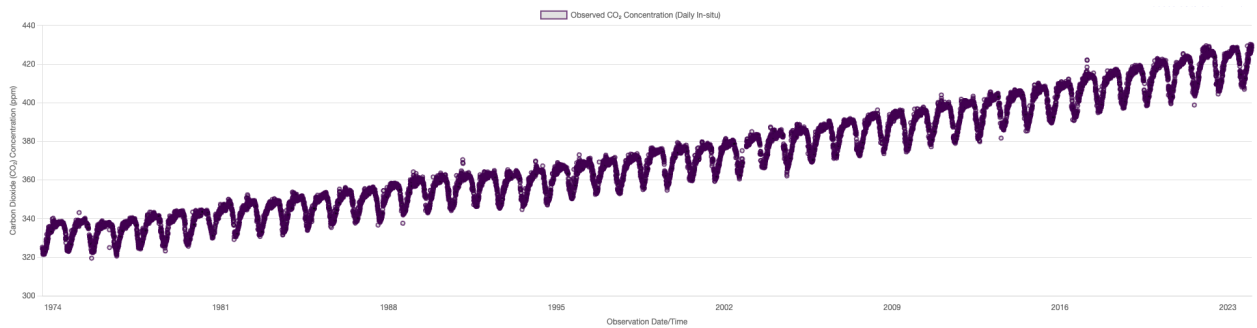


Fig. Ground truth daily Insitu data

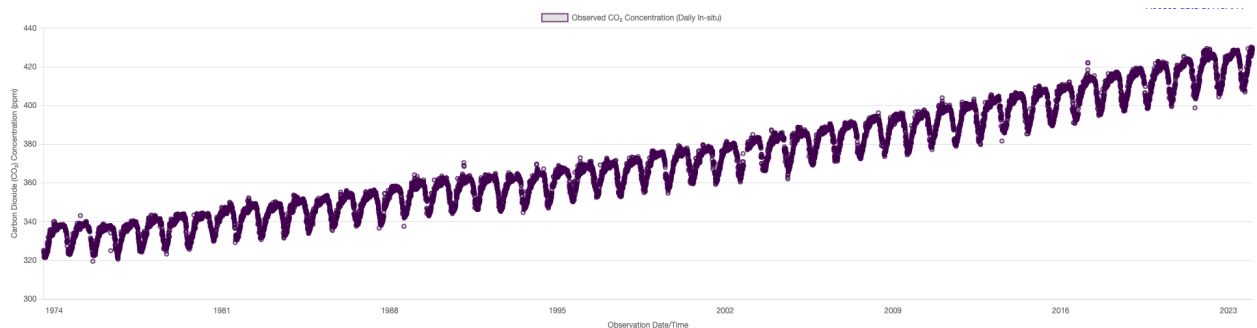


Fig. Daily average Insitu data

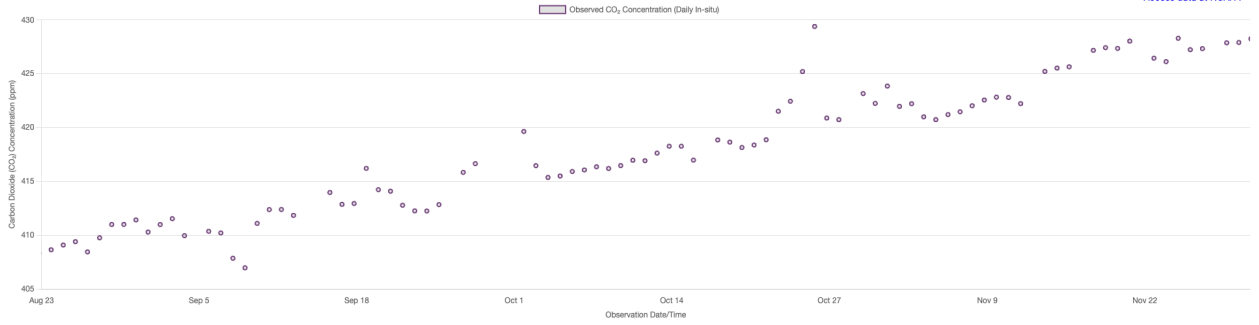


Fig. Ground truth daily Insitu data (zoomed to August 23 to November 29, 2023)

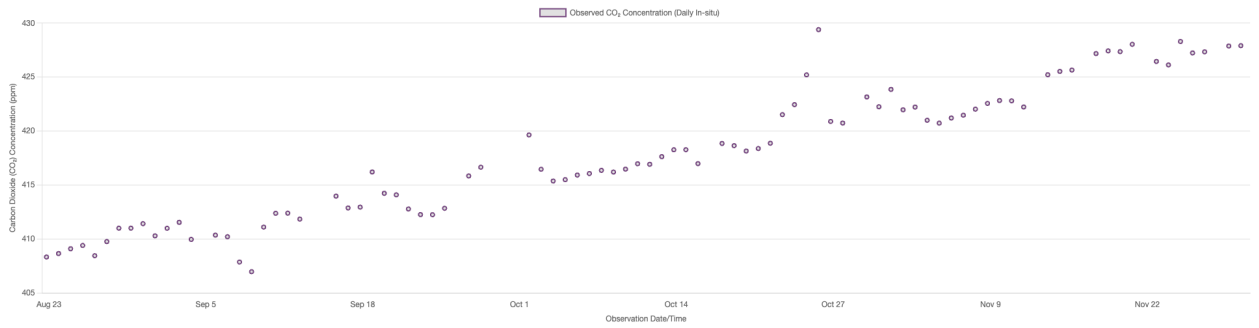


Fig. Daily average Insitu data (zoomed to August 23 to November 29, 2023)

Here, we can see that the daily average data is identical when compared to the daily dataset from the ground truth.

2. The ground truth monthly Insitu data versus the aggregated monthly Insitu data:

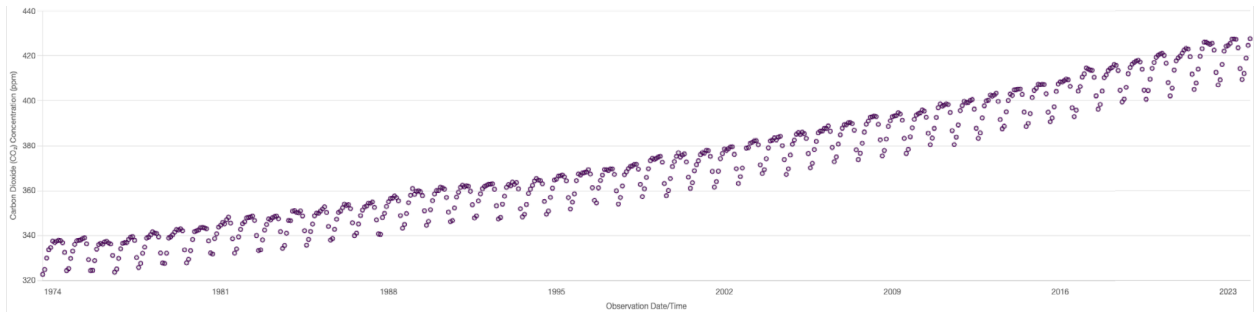


Fig. Ground truth monthly Insitu data

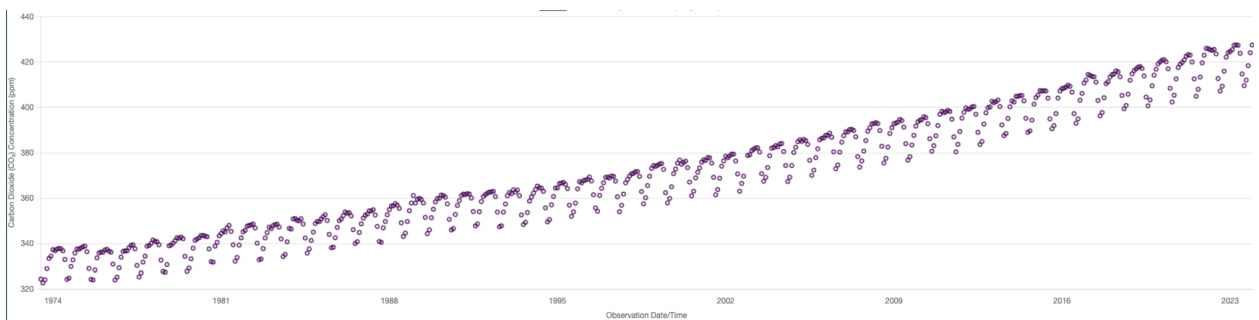


Fig. Monthly average Insitu data



Fig. Ground truth monthly Insitu data (zoomed to August 3 - November 29, 2023)



Fig. Monthly average Insitu data (zoomed to August 3 - November 29, 2023)

Here, we can see that the monthly average data (aggregated from the hourly data) is nearly identical when compared to the monthly dataset from the ground truth.

We can see that the daily and monthly averages generated using the aggregator script were the same as the daily and monthly datasets that were already available. Hence, we can confirm that the generated daily and monthly averages for the Insitu are correct.

Summary

- We are confident that the display of data in the GHG Center is correct
- There were no problems identified in the data
- Link to [Data Usage Notebook](#)
- Link to [US GHG Center Data Catalog overview page](#)

Report Completed on: 4/29/2024 (updated on 8/6/24 to include NRT data)

MSFC POC for questions: [Deborah Smith](#), [Siddharth Chaudhary](#)