

# Orbiting Carbon Observatory-2 & 3 (OCO-2 & OCO-3)



## Orbiting Carbon Observatory-2 (OCO-2) Data Quality Statement: Level 2 Forward and Retrospective Processing Data Release 11 (v11 and v11r)

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**Orbiting Carbon Observatory-2**  
**Data Quality Statement: Level 2 Forward and Retrospective**  
**Processing**  
**Data Release 11 (v11, v11r)**

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## 1 Data Quality Statement for the OCO-2 Level 2 Data Product

The Orbiting Carbon Observatory (OCO-2) has released a new version of the Level 2 (L2) data product, version 11 (v11). The data has been released in the standard data file formats, including the diagnostic and standard files. The project began the v11 forward stream processing on March 1, 2022 and all data taken after that date will only be processed in v11. Retrospective processing of the OCO-2 L2 data record in v11 is underway and this data are being made available as the processing is completed. Additionally, the OCO-2 team is currently determining the most effective screening criteria and the best bias correction method. That work is expected to be completed in June 2022 at which point the OCO-2 L2 Lite files will be produced and made available to the public. The forward and retrospective processed L2 products contain estimates of the column averaged carbon dioxide dry air mole fraction ( $X_{CO_2}$ ) and other geophysical quantities retrieved from OCO-2 observations. Updated documentation will be made available when the Lite data products are released.

The version 11 of the OCO-2 L2 products includes several improvements and fixes when compared to previous versions. The most important updates in v11 include:

- Use of an updated Digital Elevation Map (DEM) in the L2 retrievals
- Improvements in the L1B processing, including: gain degradation, dispersion trend, instrument line shape (ILS), noise model, footprint dependence
- Mitigation of previous issue with inadvertent flagging of majority of soundings over South Atlantic Anomaly
- Improvements to increase the throughput of the solar-induced chlorophyll fluorescence (SIF) retrievals
- Spectroscopy updates
- Updates to the absorption coefficient scaling factors used in the L2 retrievals that will help mitigate the overall  $X_{CO_2}$  bias and  $CO_2$  profile shape issues
- Improvements to the ocean surface treatment that improve the linearity of retrievals over ocean
- Minor updates to land bidirectional reflectance distribution function (BRDF)
- New  $CO_2$  *a priori* profiles
- Changes to the rules that govern sounding selection
- A fix for an issue with SIF availability for target mode observations (this will be seen in the L2 SIF lite files)

More information on these updates will be provided in an updated OCO-2 Data User's Guide which will be available when the v11 Lite files are first released, expected in June 2022.

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### 3 Links

- OCO-2 Mission [web site](#)
- OCO-2 L2 v10 Standard Data summary page at the Goddard DISC: [link](#)
- Related: OCO-3 Mission [web site](#)
- Related: OCO-3 L2 v10.4 Lite File page at the Goddard DISC [page](#)
- Related: JPL retrievals using the radiances from the Japanese GOSAT satellite, known as the Atmospheric CO2 Observations from Space (ACOS) data at the Goddard DISC [page](#)