



# Applications of Carbon Dioxide Measurements for Climate Related Studies

July 09, 10, & 16, 2024

12:00-14:00 (English) or 15:00-17:00 (Spanish) EDT (UTC-4)

Space-based CO<sub>2</sub> measurements have become an important capability in support of climate studies and to inform policy decisions. This intermediate, three-part webinar series will build on the [previous CO<sub>2</sub> training from 2022](#), providing a more in-depth review of OCO-2 and OCO-3 measurements along with demonstrations of case-studies. The latter will focus on how to read, visualize, and interpret the data, how to account for quality flags in an analysis, how to use the data from the OCO missions to analyze impacts of an El Niño event on atmospheric CO<sub>2</sub> and carbon sources and sinks, and how to examine spatial variations of CO<sub>2</sub> over a metropolitan area. The demonstration will be done using Jupyter Notebook.

## Part 1: XCO<sub>2</sub> from OCO-2 and OCO-3: Mission Recap, and Data Characteristics and Limitations

ARSET Trainers: Erika Podest (JPL/Caltech)

Guest Instructors: Vivienne Payne (JPL/Caltech), Abhishek Chatterjee (JPL/Caltech), Junjie Liu (JPL/Caltech)

- Identify the characteristics and limitations of XCO<sub>2</sub> measurements from OCO 2/OCO-3.
- Explore application areas where XCO<sub>2</sub> is useful.
- Identify where to access and how to use the quality flags in a data set for assessment of the measurement.
- Interpret data and address considerations for using CO<sub>2</sub> in different application areas.

## Part 2: The Impact of Drought on CO<sub>2</sub>

ARSET Trainers: Erika Podest (JPL/Caltech)

Guest Speakers: Junjie Liu (JPL/Caltech), Karen Yuen (JPL/Caltech), David Moroni (JPL/Caltech)

- Identify El Niño event effects that can create regional drought conditions.
- Monitor global fluxes of atmospheric CO<sub>2</sub> concentrations to identify vulnerable areas.
- Use OCO-2 data to visualize areas impacted by drought and perform an interpretative and comparative analysis.
- Identify the methods and processes to derive fluxes with atmospheric CO<sub>2</sub> measurements and interpret regional flux perturbations and country-scale fluxes and emissions.
- Follow steps to clone the ARSET Github repository and maintain the local code.



ARSET empowers the global community through remote sensing training.

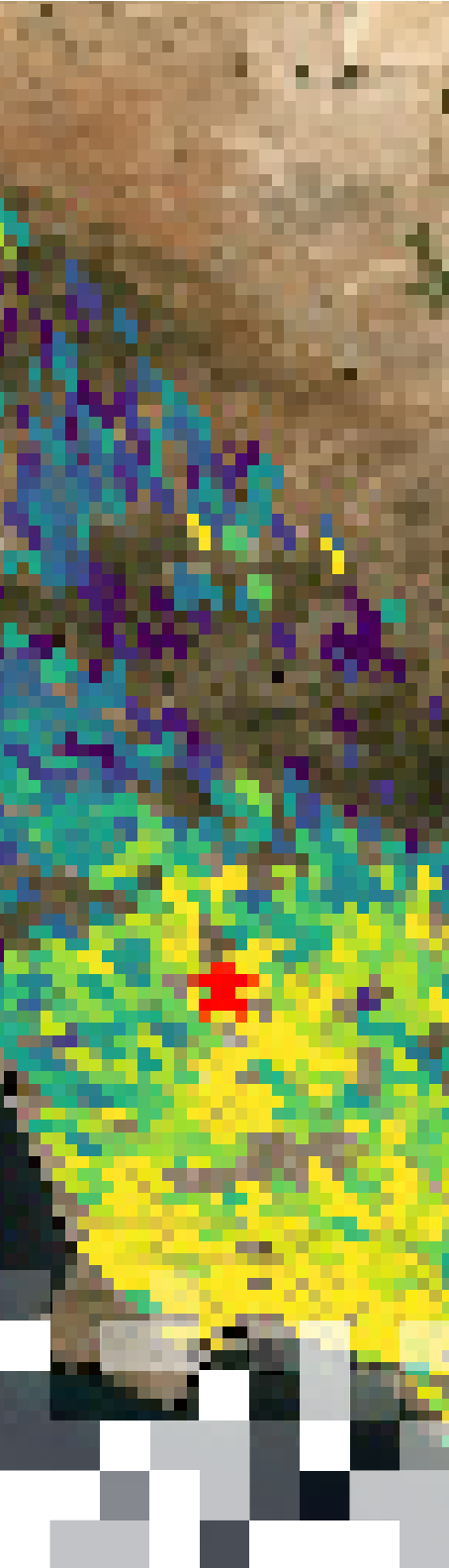


### Part 3: CO2 Measurements over a Large Urban Area

ARSET Trainers: Erika Podest (JPL/Caltech)

Guest Instructors: Abhishek Chatterjee (JPL/Caltech), Karen Yuen (JPL/Caltech), David Moroni (JPL/Caltech)

- Recognize the importance and challenges of measuring carbon dioxide over metropolitan areas.
- Identify important aspects of space-based CO2 measurements over urban areas.
- Visualize OCO-3 SAM data over urban areas and perform an interpretative and comparative analysis.
- Access, subset, and download multi-year OCO-3 SAM data using a provided Jupyter notebook.



ARSET empowers the global community through remote sensing training.