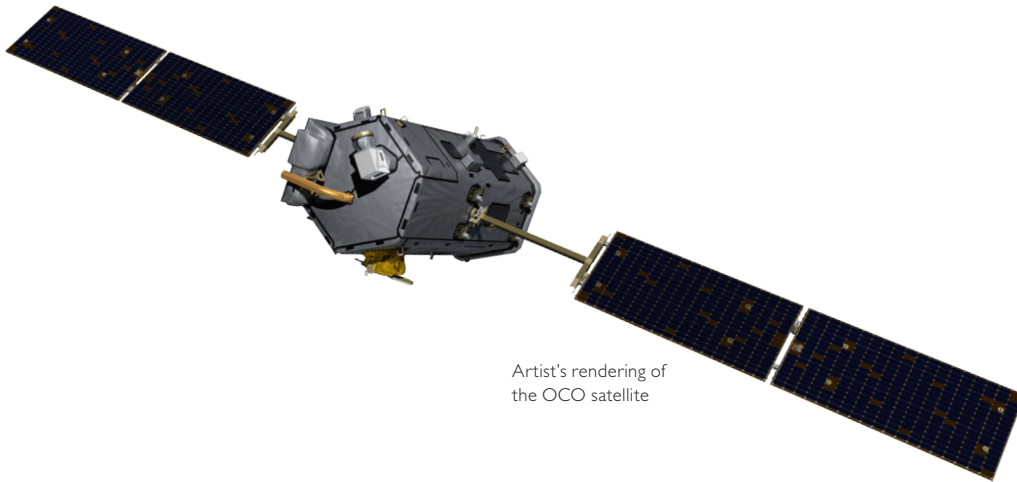




# OCO-2

Orbiting Carbon Observatory-2



Artist's rendering of the OCO satellite

## Mission Overview

The Orbiting Carbon Observatory-2 (OCO-2) is a "carbon copy" of the OCO spacecraft lost due to a launch vehicle anomaly. OCO-2 is designed to make the first space-based measurements of atmospheric carbon dioxide (CO<sub>2</sub>), an important greenhouse gas. Fossil fuel use and other human activities have almost doubled the concentrations of this gas since the beginning of the industrial revolution. Atmospheric carbon dioxide is an efficient greenhouse gas because it absorbs and traps infrared radiation (heat) emitted by the Earth's surface, preventing it from escaping to space. OCO measurements will help scientists to better understand how increasing CO<sub>2</sub> concentrations will drive climate change around the globe.

Although the biosphere and oceans currently absorb about half of the CO<sub>2</sub> generated by human activities, the nature and geographic distribution of the sources and "sinks" of carbon dioxide are not clearly understood. By providing the first global CO<sub>2</sub> measurements from space, the two-year OCO mission will revolutionize our understanding of the global carbon cycle. Orbital is building the spacecraft under a contract from the Jet Propulsion Laboratory.

## QUICK FACTS:

Each carbon dioxide molecule includes one carbon atom (C) sandwiched between two oxygen (O) atoms, forming a linear molecule, with the structure O=C=O

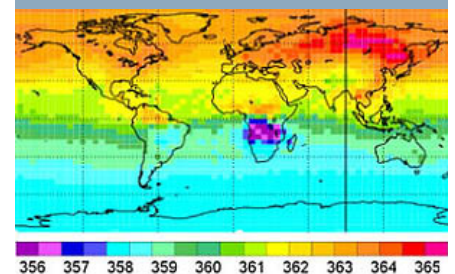
All animals release CO<sub>2</sub> into the atmosphere as a by-product of metabolism. Plants absorb CO<sub>2</sub> from the air and use it, sunlight, water and oxygen to produce their own energy (photosynthesis). Nearly everything we eat comes directly or indirectly from this "carbon cycle."

### Mission:

NASA Earth System Science  
Pathfinder (ESSP) program

### Customer:

Jet Propulsion Laboratory -  
Pasadena, CA



Simulated OCO science data product showing Column CO<sub>2</sub> (4° x 5° grid)

## Specifications and Salient Features

### Spacecraft

Satellite Mass:	447 kg (985 lb.)
Solar Arrays:	Triple junction GaAs
Power:	521 W orbit average
Communications:	S-band transceiver and X-band science data transmitter
Stabilization:	3-axis, zero momentum
Propulsion:	Hydrazine
Orbit:	705 km, flying in polar, sun-synchronous formation with EOS A-train
Mission Life:	24 months
Status:	Integration and Test

### Payload

Instrument:	3 grating spectrometers operating in pushbroom mode
Bandpasses:	0.76, 1.58, 2.06 microns
Instantaneous Field of View:	1.0 km x 1.5 km
Swath:	10 km

### Launch

Launch Vehicle:	TBD
Site:	TBD
Date:	TBD

## Mission Team

### Jet Propulsion Laboratory (JPL)

*Pasadena, CA* – Project management, system engineering, ground data systems, instrument and operations lead

### Orbital Sciences Corporation

*Dulles, VA; Gilbert AZ; Vandenberg Air Force Base, CA* – Spacecraft design, integration and test, launch operations and spacecraft flight operations

## Science Team

International science team with co-investigators from the United States, France, Germany, New Zealand, and Australia



The OCO satellite in production