

THE VALUE OF PERFORMANCE.

NORTHROP GRUMMAN

OCO-2

Orbiting Carbon Observatory-2

The Orbiting Carbon Observatory-2 (OCO-2) is designed to make NASA's first space-based measurements of atmospheric carbon dioxide (CO₂), 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-2 measurements help scientists to better understand how increasing CO₂ concentrations drive climate change around the globe.

Although the biosphere and oceans currently absorb about half of the CO₂ 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 CO₂ measurements from space, the two-year OCO-2 mission has revolutionized our understanding of the global carbon cycle. Northrop Grumman built the spacecraft under a contract from the Jet Propulsion Laboratory.

Facts At A Glance

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 CO₂ into the atmosphere as a by-product of metabolism. Plants absorb CO₂ 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

Specifications

Spacecraft

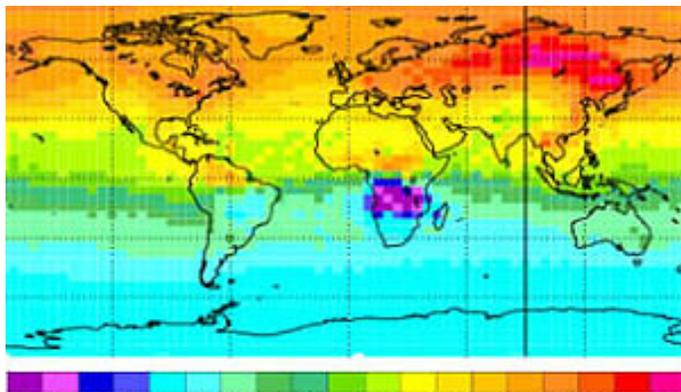
Mass:	447 kg (985 lb.)
Solar Arrays:	Triple junction GaAs
Power:	410 W orbit average
Communications:	S-band transceiver and X-band science data transmitter
Stabilization:	3-axis, Zero Momentum Bias
Pointing:	279 arcsec control, 157 arcsec knowledge
Propulsion:	Hydrazine
Orbit:	705 km, flying in polar, sun-synchronous formation with EOS A-train
Mission Life:	24 months
Status:	Operational

Payload

Instrument:	3 grating spectrometers
Bandpasses:	0.76, 1.58, 2.06 microns
Instantaneous:	1.29 km x 2.25 km
Field of View	
Swath:	10 km

Launch

Launch Vehicle:	Delta II
Site:	Vandenberg Air Force Base, California
Date:	July 2, 2014



Simulated OCO science data product showing Column CO2 (4° x 5° grid)

Mission Partners

Jet Propulsion Laboratory

Project management, system engineering, ground data systems, instrument and operations lead

Science Team

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

Northrop Grumman

Spacecraft design, integration and test, launch operations and spacecraft flight operations



The OCO-2 satellite at Northrop Grumman's Gilbert, Arizona satellite manufacturing facility

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