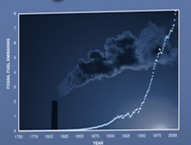
National Aeronautics and Space Administration

OCO-2
Orbiting Carbon Observatory

The Mission

NASA's OCO mission will paint the first complete picture of both human and natural CO_2 sources and sinks.

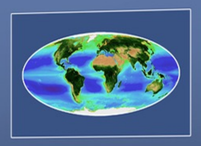


Fossil Fuels

Since the Industrial Revolution, humans have added more than 1,400 billion tons of CO_2 to Earth's atmosphere by burning coal, oil, and natural gas. These fossil fuel emissions have increased atmospheric CO_2 to levels unprecedented over the past 800,000 years. But the increase in atmospheric CO_2 has been less than half of emissions. The remainder transferred into the world's oceans and plants and soils on land.

Land

Plants and soils store carbon from the atmosphere. Land use and land cover change, development, and other human activities as well as natural events such as hurricanes or fire release carbon from terrestrial pools, but during recovery, ecosystems on land again accumulate carbon. These processes create complex patterns of carbon uptake and emissions across Earth's landscape.



Oceans

The world's oceans are the primary sink for atmospheric CO_2. On average, about half of the carbon removed from the atmosphere enters the oceans, where it may be sequestered for hundreds of years. But weather and climate affect oceanic carbon uptake, and the amount of carbon transferred varies substantially year to year.

OCO-2
Orbiting Carbon Observatory

The Carbon Cycle

NASA's OCO mission will paint the first complete picture of both human and natural CO_2 sources and sinks.

Fossil Fuels

Burning coal, oil, or natural gas transfers carbon from fossil pools created hundreds of millions of years ago into Earth's atmosphere where it affects climate and ecosystems.

Fires

Fire due to human activities or natural causes also adds CO_2 to the atmosphere. Ecosystems recovering from fires accumulate carbon from the atmosphere, countering for a time emissions by fires and fossil fuel use.

Oceans

Atmospheric CO_2 mixes into surface waters and dissolves. Some of this carbon is incorporated into the biomass and shells of marine organisms. Mixing and circulation carry some carbon from surface into deeper waters where it can be stored for long periods before being released back into the atmosphere.

Vegetation

As plants grow, they use CO_2 from the atmosphere to build and maintain their biomass, thus slowing atmospheric CO_2 increases.

Soils

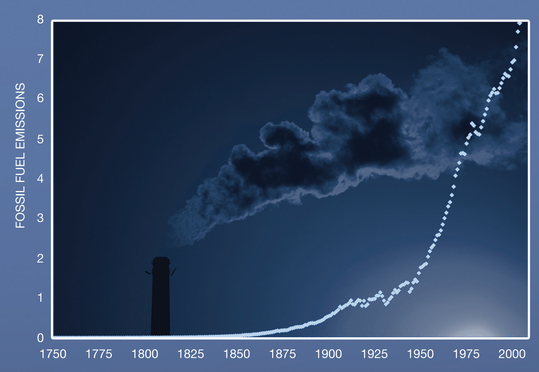
As leaves and plants die and decompose, some of the carbon in biomass is incorporated into soil where it may be stored for long periods; the remainder returns to the atmosphere as CO_2.

OCO-2
Orbiting Carbon Observatory

National Aeronautics and Space Administration

The Mission

NASA's OCO mission will paint the first complete picture of both human and natural CO_2 sources and sinks.

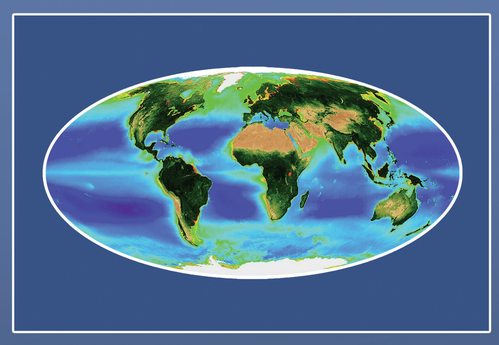


Fossil Fuels

Since the Industrial Revolution, humans have added more than 1,400 billion tons of CO_2 to Earth's atmosphere by burning coal, oil, and natural gas. These fossil fuel emissions have increased atmospheric CO_2 to levels unprecedented over the past 800,000 years. But the increase in atmospheric CO_2 has been less than half of emissions. The remainder transferred into the world's oceans and plants and soils on land.

Land

Plants and soils store carbon from the atmosphere. Land use and land cover change, development, and other human activities as well as natural events such as hurricanes or fire release carbon from terrestrial pools, but during recovery, ecosystems on land again accumulate carbon. These processes create complex patterns of carbon uptake and emissions across Earth's landscape.



Oceans

The world's oceans are the primary sink for atmospheric CO_2. On average, about half of the carbon removed from the atmosphere enters the oceans, where it may be sequestered for hundreds of years. But weather and climate affect oceanic carbon uptake, and the amount of carbon transferred varies substantially year to year.

The Carbon Cycle

NASA's OCO mission will paint the first complete picture of both human and natural CO_2 sources and sinks.

Fossil Fuels

Burning coal, oil, or natural gas transfers carbon from fossil pools created hundreds of millions of years ago into Earth's atmosphere where it affects climate and ecosystems.

Fires

Fire due to human activities or natural causes also adds CO_2 to the atmosphere. Ecosystems recovering from fires accumulate carbon from the atmosphere, countering for a time emissions by fires and fossil fuel use.

Oceans

Atmospheric CO_2 mixes into surface waters and dissolves. Some of this carbon is incorporated into the biomass and shells of marine organisms. Mixing and circulation carry some carbon from surface into deeper waters where it can be stored for long periods before being released back into the atmosphere.

Vegetation

As plants grow, they use CO_2 from the atmosphere to build and maintain their biomass, thus slowing atmospheric CO_2 increases.

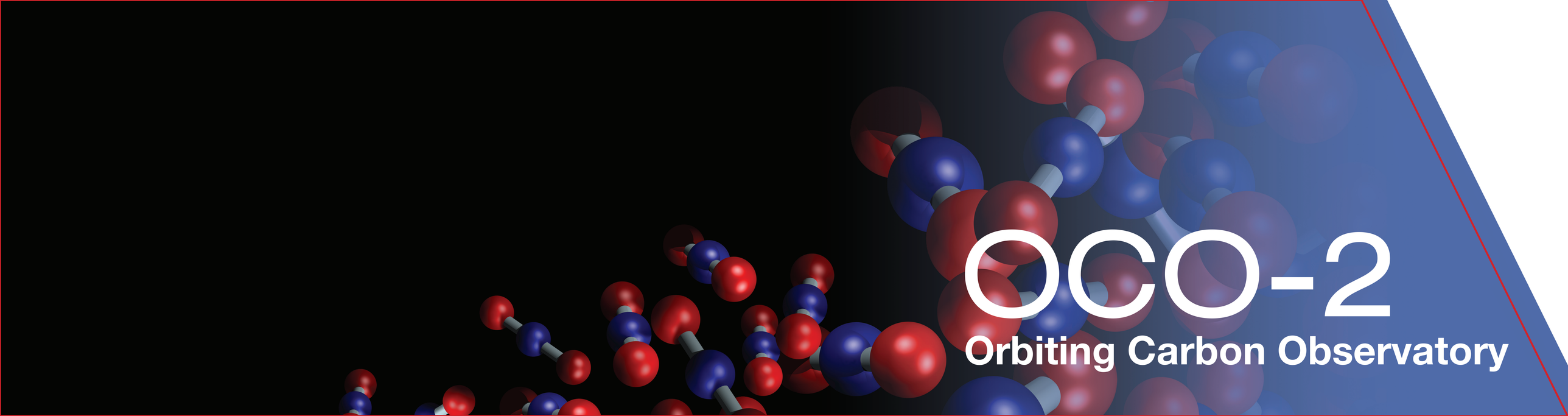
Soils

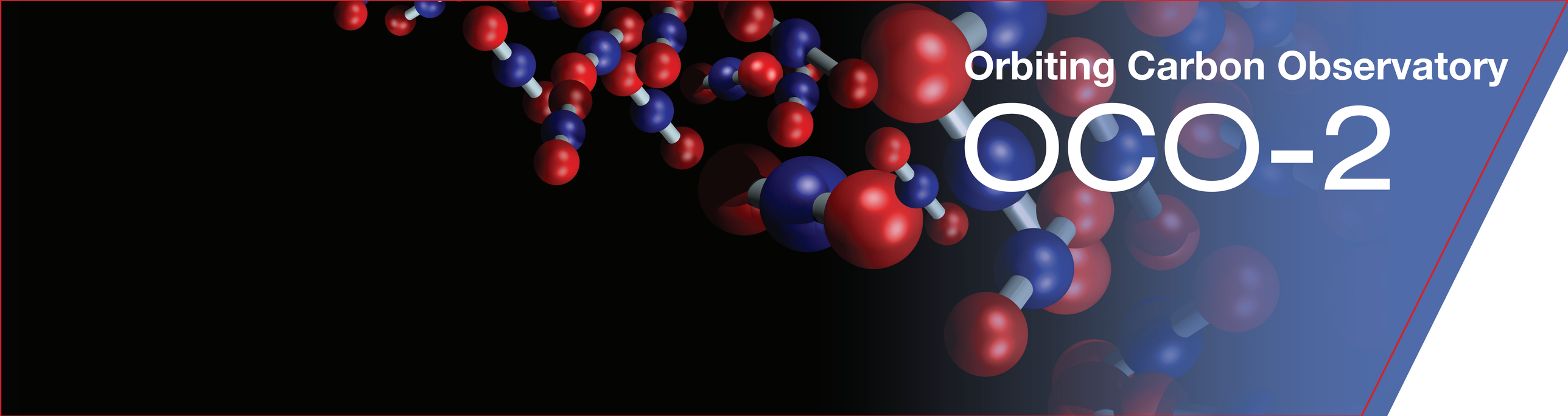
As leaves and plants die and decompose, some of the carbon in biomass is incorporated into soil where it may be stored for long periods; the remainder returns to the atmosphere as CO_2.

www.nasa.gov

OCO-2

Orbiting Carbon Observatory


OCO-2
Orbiting Carbon Observatory


Orbiting Carbon Observatory
OCO-2