

Early XCO₂ Estimates from the NASA Orbiting Carbon Observatory-2 (OCO-2)

D. Crisp¹ and The Orbiting Carbon Observatory Science Team²

¹Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA 91109; 818-354-2224, E-mail: David.Crisp@jpl.nasa.gov

²National Aeronautics & Space Administration (NASA), Greenbelt, MD 20771

The NASA Orbiting Carbon Observatory-2 (OCO-2) was successfully launched from Vandenberg Air Force Base in California on 2 July 2014. After completing a series of spacecraft check-out and orbit-raising activities, OCO-2 joined the 705 km Afternoon Constellation (A-Train) on August 3, 2014. Its 3-channel imaging grating spectrometer was then cooled to its operating temperatures and a series of calibration and validation activities was initiated. By early September, it was routinely collecting about a million soundings over the Earth's sunlit hemisphere each day. Preliminary cloud screening efforts indicate that up to 25% of these soundings (250,000/day) may be sufficiently cloud free to yield full column estimates of the column averaged CO₂ dry air mole fraction, XCO₂. The OCO-2 team started releasing calibrated, geo-located, spectra to the science community through the NASA Goddard Earth Sciences Data and Information Services Center (GES-DISC) on 30 December, 2014. Deliveries of a preliminary Level 2 product, including estimates of XCO₂, surface pressure, and solar-induced chlorophyll fluorescence (SIF), were initiated on 30 March 2015. One week of nadir observations over land are shown in Figure 1. These products are currently being validated against measurements from the Total Carbon Column Observing Network (TCCON) and other standards.

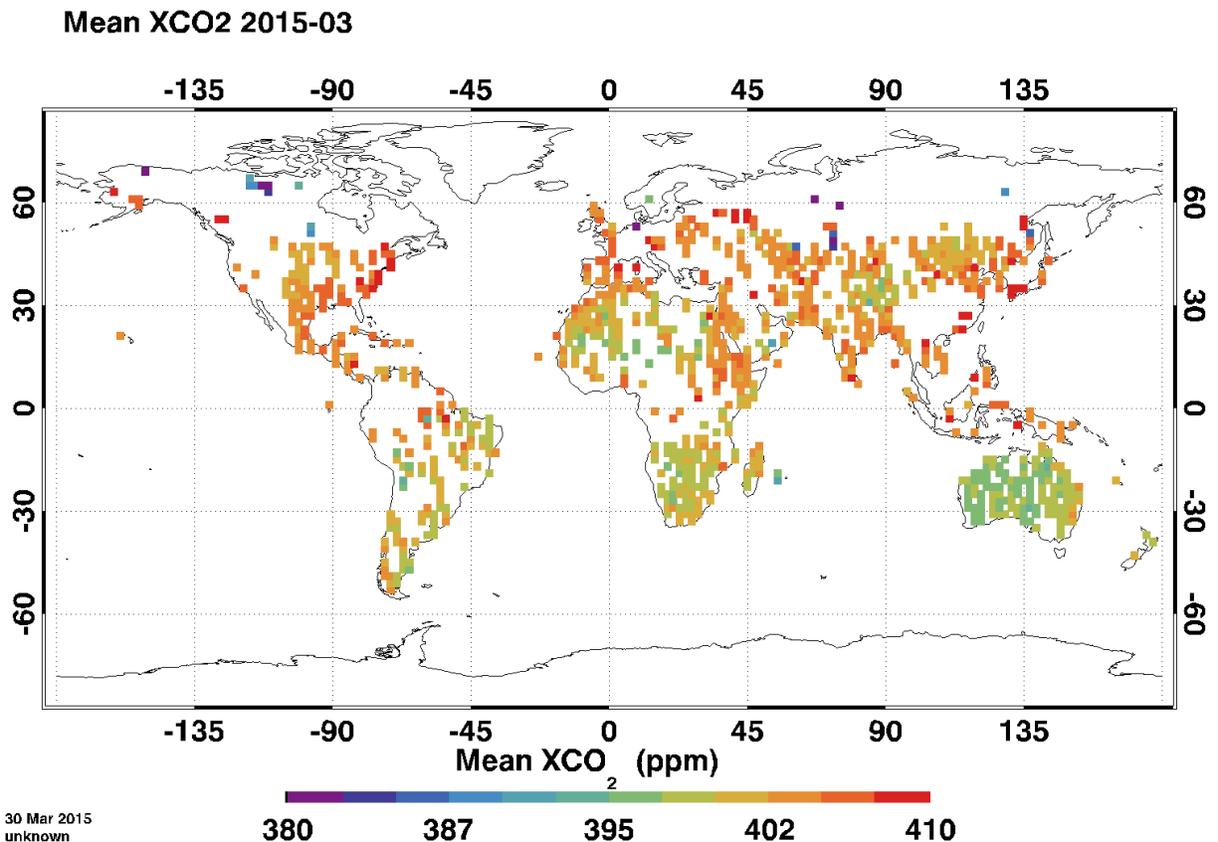


Figure 1. Snapshot of OCO-2 XCO₂ estimates, binned in 2° by 2° bins, for the period extending from 22 – 29 March 2015. The Observatory was collecting observations at the local nadir during this period, so only retrievals over land are shown.