



## **IEAGHG Information Paper 2014-27; Orbiting Carbon Observatory (OCO-2)**

For those of you that follow NASA developments there is some interesting breaking news that relate to global GHG emissions. The Orbiting Carbon Observatory 2 is an American environmental science satellite which launched on 2 July 2014. A NASA mission, it is a replacement for the Orbiting Carbon Observatory which was lost in a launch failure in 2009. OCO-2's key objective is to trace the global geographic distribution of CO<sub>2</sub> in the atmosphere - measuring its presence down through the column of air to the planet's surface.

The first results from the first 90 day operational period for the satellite have hit the press. The BBC news today ran an article on the early results. See <http://www.bbc.co.uk/news/science-environment-30399073>

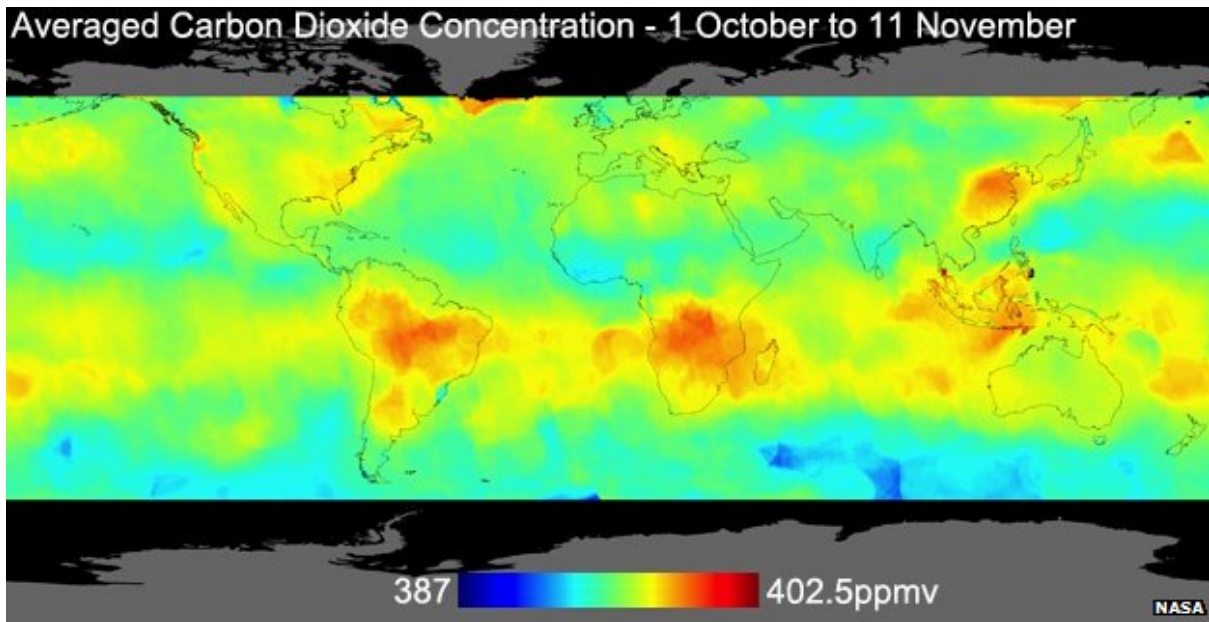
*Nasa's Orbiting Carbon Observatory (OCO-2) has returned its first global maps of the greenhouse gas CO2. This should help scientists better understand how human activities are influencing the climate. The new maps contain only a few weeks of data in October and November, but demonstrate the promise of the mission. Clearly evident within the charts is the banding effect that describes how emitted gases are mixed by winds along latitudes rather than across them. Also apparent are the higher concentrations over South America and southern Africa. These are likely the result of biomass burning in these regions. It is possible to see spikes, too, on the eastern seaboard of the US and over China. These probably include the additional emissions of CO2 that come from industrialisation.*

*Deputy project scientist Annmarie Eldering, from NASA is quoted as saying:.*

*"We're very early into the mission and collecting data, yet as we show, we can take five weeks of that information and give you a quick picture of global carbon dioxide," said*

*"It really suggests to us that OCO-2 will be very useful for finding out about where carbon dioxide is coming from and being taken back up around the globe," she told BBC News.*

The maps were first presented here at the American Geophysical Union Fall Meeting in San Francisco and at COP20 in Lima where Tim Dixon saw it.



The objective for this work is that scientists want to know how exactly the greenhouse gas cycles through the Earth system - the carbon cycle. As we know anthropogenic emissions add something like 40 billion tonnes of the gas to the atmosphere every year, principally from the burning of fossil fuels. However, the ultimate destination of this carbon dioxide is still considered to be uncertain. About half is thought to be absorbed into the oceans, with the rest pulled down into land "sinks". It is hoped OCO-2 can describe those draw-down locations in much more detail.

Climate scientists it seems are getting excited about this early snapshot, and comments made suggest that the scientists can see that some of their existing models will have to be revised.

The Orbiting Carbon Observatory has been spoken of by NASA as the forerunner of satellite missions that would seek to gain the information needed to patrol climate treaties, by helping to check that promises made by nations on carbon curbs were being kept. Now that really takes us to the next level – “big brother is watching you”

Clearly it is early days on OCO-2 but the results to date are exciting. We will continue to follow the OCO-2 results as they are made available and keep members posted on developments. Who knows that could be a key note at a future GHGT.

For the trekkies out there, there is a lot more technical detail on the satellite at: [http://en.wikipedia.org/wiki/Orbiting\\_Carbon\\_Observatory\\_2](http://en.wikipedia.org/wiki/Orbiting_Carbon_Observatory_2).

And for those that want more information then go to the NASA web site: <http://oco.jpl.nasa.gov/mission/>

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