



PRESS RELEASE | PARIS | 14 JUNE 2016

CO₂ hits record highs in the Southern hemisphere

Last month, the atmospheric concentration of carbon dioxide (CO₂) as measured at Amsterdam Island, in the southern Indian Ocean, for the first time exceeded the symbolic value of 400 ppm¹, or 0.04%. The CO₂ concentrations recorded at the Amsterdam Island research station are the lowest in the world (excluding seasonal cycles), due to the island's remoteness from anthropogenic sources. The 400 ppm threshold was already crossed in the Northern hemisphere during the 2012/2013 winter. In addition, the increase of CO₂ in the atmosphere is speeding up, growing by more than 2 ppm annually over the past four years. The data has been collected for the past 35 years at the Amsterdam Island research station by the French national observation service ICOS-France at the Laboratoire des Sciences du Climat et de l'Environnement (LSCE, CNRS / CEA / UVSQ)², with the support of the Institut Polaire Français Paul-Emile Victor (IPEV).

Due to its remote location, the air in Amsterdam Island is among the cleanest in the world, with the lowest carbon dioxide (CO₂) concentrations (excluding seasonal variations in the Northern hemisphere where, every summer, the amount of CO₂ in the atmosphere falls due to periodic absorption by plants). It has become a reference site for atmospheric chemistry in the Southern hemisphere and is one of the thirty stations in the WMO³ global network for atmospheric composition monitoring. The measurements carried out there are used to monitor changes in greenhouse gases (such as CO₂, CH₄, and N₂O) and to better quantify the role of the Southern Ocean as a carbon sink. This is performed at an observatory belonging to the French national observation service ICOS-France⁴, currently coordinated by Michel Ramonet and Marc Delmotte, researchers at the LSCE (CNRS / CEA / UVSQ). The observatory can draw on LSCE's expertise and has been supported by IPEV since it was set up in 1981. Civic service volunteers are in charge of maintaining the facility.

The concentration of carbon dioxide in the atmosphere has been continuously measured there over the past 35 years. For the first time ever, it exceeded 400 ppm in May 2016. The CO₂ value recorded by this observatory shows very little seasonal variation (<1 ppm), which means that the increase observed is indicative of the long-term trend.

Since 1981, carbon dioxide concentrations have risen from 339 to 400 ppm (+18%), which is an average increase of 1.75 ppm per year. In addition, researchers have recorded higher increase rates in the past

¹ ppm: parts per million (1 ppm in volume is equal to 1 cm³ per m³ of air).

² LSCE is a laboratory belonging to the Institut Pierre-Simon Laplace (IPSL).

³ World Meteorological Organization.

⁴ This service belongs to the Observatoire des Sciences de l'Univers OVSQ

few years: the increase of CO₂ in the atmosphere is accelerating, since the annual increase rate observed, which was 1.30 ppm in the 1980s, is now more than 2 ppm per year since 2012 (Figure 4).

The 400 ppm value was already exceeded at monitoring stations in the Northern hemisphere in winter 2012/2013. Crossing the 400 ppm threshold at Amsterdam Island therefore means that this value has been reached practically all over the planet.



Atmospheric composition observatory on Amsterdam Island. © O. Llido



Experimental set-up for measuring greenhouse gas concentrations. © O. Llido

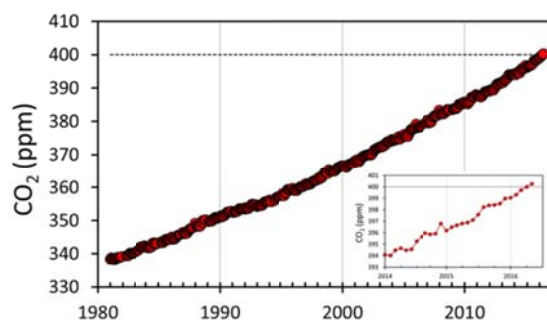


Figure 3: Mean monthly concentrations measured at Amsterdam Island. © M. Ramonet

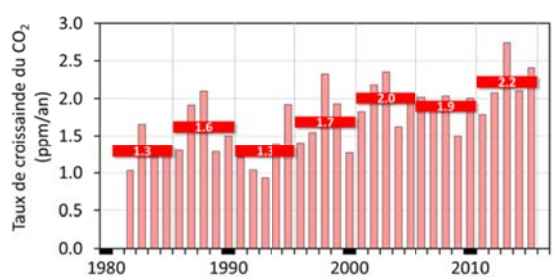


Figure 4: Mean increase rate of atmospheric CO₂ at Amsterdam Island. The red bars indicate increase rates averaged out over 5-year periods. © M. Ramonet

An *animation* showing changes in CO₂ concentration since 1981 at Amsterdam Island is available (© O. Jossoud et M. Ramonet) <http://www2.cnrs.fr/en/2775.htm>

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