

Southern America stratospheric ozone variation during the last decade (1996-2005)

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Stratospheric ozone variation in the last decade reveals important dynamics of environmental areas in Brazil, possible to be correlated with natural disasters like droughts in the Amazon region and the first hurricane observed in Santa Catarina, at sea temperatures below 22°C, in South America.

A team of 74 ozone specialists, lead by Prof. Fahey from 1965 to 2001, elaborated a very well known graphic. The graphic shows that the global ozone remained constant from 1965 to 1980 with 3,000 megatons of Global Ozone, when it started to quickly decline in approximately 3% or 80 megatons per year. In 2001 more than 50% of the ozone was depleted, IPCC specialists recognize the ozone depletion of Fahey studies in the IPCC 2001 8-1 decision; the Climate Change and the Ozone Depletion. In 2002 Fahey's works went through a deep methodological conference, being approved by 44 more specialists in Atmospheric Chemistry in Les Diabretes, Switzerland. The ozone hole after 1985, reached about 27 millions km² or 5% of the surface of the Planet and there practically all the stratospheric ozone annually disappeared in the beginning of October. Projecting these figures until 2005 we reached 70%, when Katrina Hurricane and Amazons River drought happens and in 2015 the depletion will reach 100%.

But between 2003 and 2005, the IPCC, using the same graphic and exchanging the “annual loss % of ozone” quota for “deviation %” specialist starts saying that the problem will be solved, in 2050. That the biggest “deviation” of -5% was in 1993 because of the eruption of the Pinatubo volcano, but the average “deviation” was of -3% until 2005, will drop to -2% in 2020 reaching positive figures in 2050. We verified that there was an exchange in the same graphic from “deplete” to “deviation”. The “Ozone hole” non existent in the 70's reach 27 million km² or 5.2% of the Earth's surface (3.2 times the Brazilian territory) where it certainly disappears in every years September end or October first days, were 3% of the ozone deplete when the polar stratosphere clouds (PSC) dissipates.

For other side, we observed measures taken aboard satellites from 32 places representing South America from the Equator to the polar region. Drawing the measured ozone intensity graphic in Dobson Units versus the days of the year, during a decade, we founded the average decrease rate for each site. The Natal, RN region, the rate in-

licated a important decrease even in a equatorial region. The average decrease rate for the whole region understood as Latin America was of 4.3% of the stratospheric ozone decrease compared to the year of 1996. In this work, we present the methodology, the discussion and conclusion of these measure and comparisons.

We develop two aeronautic process actions in our MODCLIMA project, one in the month September, producing artificial stratospheric rain by an process of “rain wash” in the CIO gas found inside the PSC Polar Stratospheric Cloud, to obstruct the depletion of the polar ozone and another to produce ozone at the equatorial stratosphere, through adjusted Doppler process, “in situ” to help replacing the ozone that is being depleted.