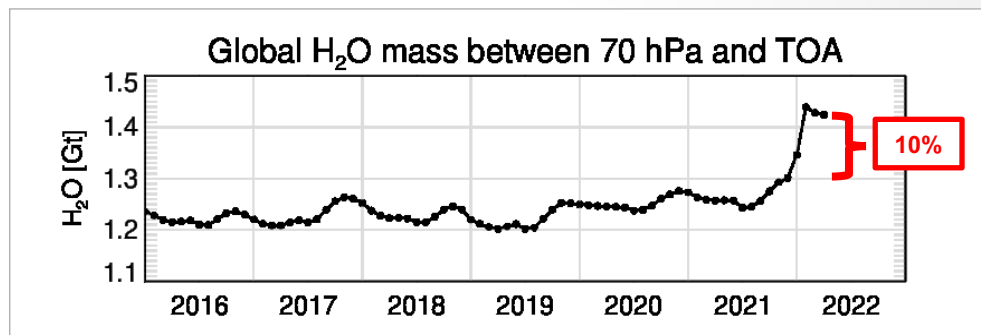
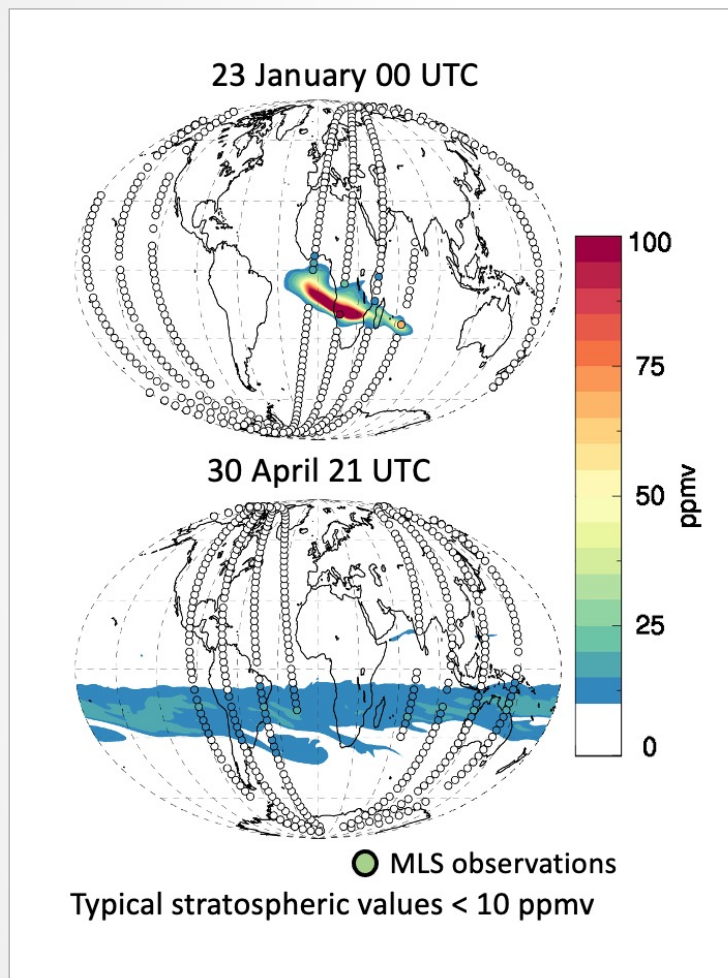


Unprecedented Amount of Water Vapor Injected into the Stratosphere by the Hunga Tonga Eruption



The eruption of the submarine volcano, Hunga Tonga–Hunga Ha'apai, on 15 January 2022, injected a large amount of water vapor into the middle atmosphere, increasing stratospheric moisture to levels much higher than previously observed. The maps, produced using assimilation of Microwave Limb Sounder (MLS) data, show water vapor at approximately 26 km one week and 3.5 months after the eruption.

The increase of total H₂O mass between 70 hPa and the top of the atmosphere was 10% globally. The plume dispersed throughout the tropics by May, but the total amount of additional H₂O remained almost constant since the eruption, leading to significant cooling at the southern midlatitudes around 25–30 km above the earth's surface.