

Record High March 2024 Arctic Total Column Ozone

Man-made chlorofluorocarbons (CFCs) depleted the Earth ozone layer. The 1987 Montreal Protocol curbed CFC growth, but because CFCs have multi-decadal lifetimes, Arctic ozone is not expected to recover back to 1980 levels until ~2045.

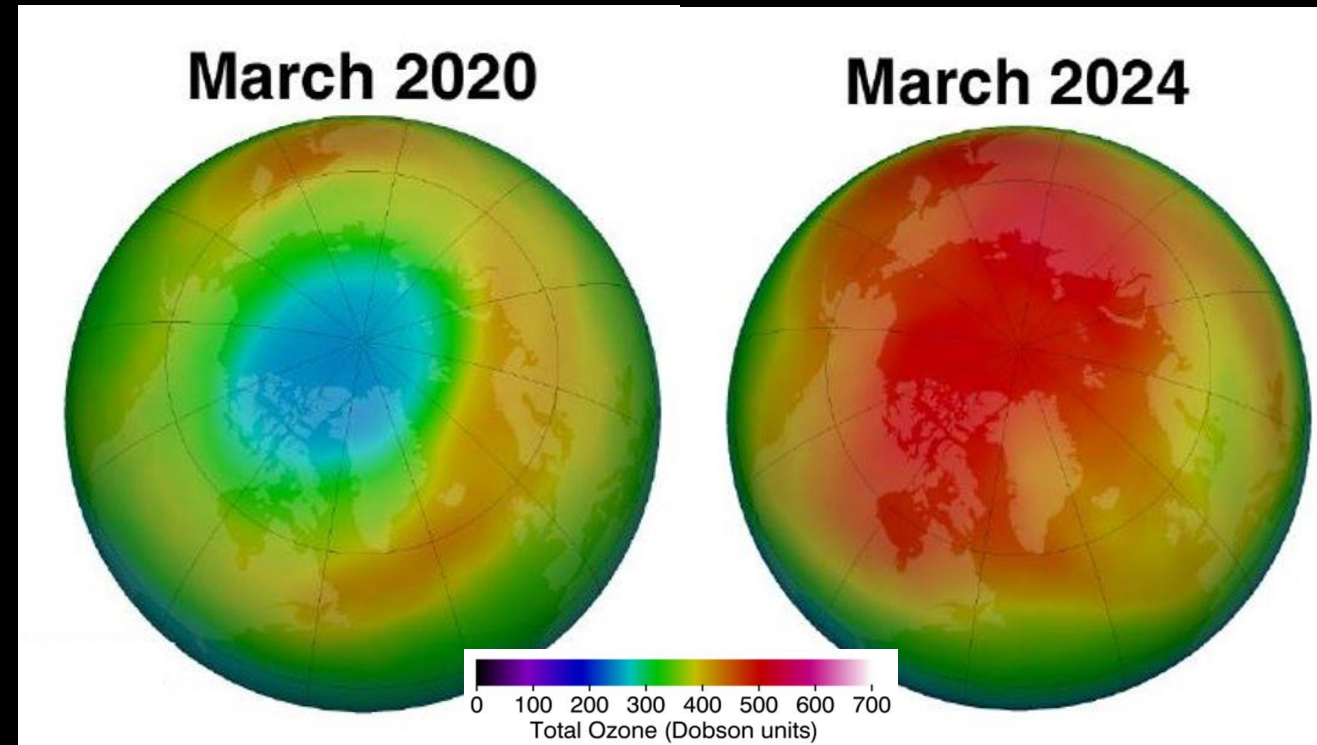
Current high CFC levels combined with persistent cold polar vortices led to severe Arctic ozone spring depletion in 1997, 2011, and 2020.

Contrary to expectations, March 2024 Arctic ozone showed a record high level, dramatically contrasting against the severe depletion events.

The exceptional 2024 ozone was mainly found in the lowermost Arctic stratosphere, where temperatures also set a record high in March 2024 in the MERRA-2 reanalysis data.

The ozone levels incrementally increased during the 2023–2024 winter because of large-scale weather systems that propagated from the troposphere into the stratosphere, moving more ozone from the mid-latitudes and upper stratospheric into the Arctic region.

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False color images of March averaged ozone for March 2020 and March 2024.

