



# Global Union Against Radiation Deployment from Space

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## Planned Global WiFi from Space Will Destroy Ozone Layer, Worsen Climate Change, and Threaten Life on Earth

Eight companies are gearing up to provide high-speed global WiFi coverage from space within the next three to four years. This would be an ecological and public health nightmare.

The planned extensive satellite networks would require the launch of hundreds of kerosene-burning rockets annually. This would re-distribute the ozone layer and significantly contribute to climate change.

Martin Ross of the Aerospace Corporation was the lead author of a paper published in 2010 titled "Potential climate impact of black carbon emitted by rockets." The authors developed a computer model to predict what would happen in different parts of the planet if the number of launches burning kerosene (then 25 annually) increased by a factor of 10. His model predicts as much as a 4% loss of ozone over the tropics and subtropics, as much as a 3-degree Celsius summertime increase in temperature over the South Pole, more than a 1-degree Celsius overall increase in Antarctic temperature, and a decrease in Antarctic sea ice by 5% or more.

In a 2011 Aerospace article titled "Rocket Soot Emissions and Climate Change," Ross states "The Aerospace study shows that the radiative forcing of soot from a given hydrocarbon rocket scenario is as much as 100,000 times that of the carbon dioxide from the rockets." Obviously, the soot or black carbon emissions would be an important factor in accelerating climate change if the planned launches move forward.

Solid state rocket exhaust is no better. It contains ozone-destroying chlorine, water vapor (a greenhouse gas), and aluminum oxide particles, which seed stratospheric clouds. Complete ozone destruction is observed in the exhaust plumes of solid state rockets.

The New York Times (May 14, 1991, p. 4) quoted Aleksandr Dunayev of the Russian Space Agency saying, "About 300 launches of the [space] shuttle each year would be a catastrophe and the ozone layer would be completely destroyed."

At that time, the world averaged only 12 rocket launches per year. Maintaining a fleet of (ultimately) 4,000 satellites, each with an expected lifespan of 5 years, will likely involve enough yearly rocket launches to be an environmental catastrophe.

Project Loon also has serious environmental consequences separate from the environmental hazard posed by flooding the planet with pulsed microwave radiation. Project Loon utilizes a scarce resource - helium - with reckless abandon. Helium is key to the function and manufacture of many technologies. Helium also has important scientific and hospital uses. It is a scarce fossil resource and should be conserved, not squandered. The balloons used by Project Loon are inflated with helium that is released into the atmosphere when the balloons are grounded. Furthermore, the balloons are made of polyethylene plastic, which is not biodegradable, yet the balloons are only expected to have a life-span of 10 months. Our best estimate is that it would take 100,000 balloons to provide wireless to landmasses worldwide. This is a lot of polyethylene to discard and a lot of helium to waste.

### References

- Ozone depletion and climate change from rocket exhaust: (<http://www.eucass-proceedings.eu/articles/eucass/pdf/2013/01/eucass4p657.pdf>).
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- "Limits on the Space Launch Market Related to Stratospheric Ozone Depletion," the full text of a 2009 article by Martin N. Ross of the Aerospace Corporation: (<http://www.tandfonline.com/doi/full/10.1080/14777620902768867#abstract>).
- The world is running out of helium: Nobel prize winner: (<http://phys.org/news/2010-08-world-helium-nobel-prize-winner.html>)