

Zones nearly free of radio frequency radiation



The use of radio transmitters is restricted in several areas around the world. In some, they are nearly banned entirely. People with severe electrical hypersensitivities have moved to some of them for health reasons.

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The white zone

A “white zone” is an area with no mobile phone reception. The term comes from the maps published by companies providing phone service — the areas without coverage are usually white.

Another term is “radio-quiet zone,” which is used by the people who operate radio observatories.

Some people with extreme electrical hypersensitivity (EHS) move to places with low radiation levels. This used to mean rural areas far from large cities, but as the build-out of the wireless infrastructure continues, the areas without mobile phone reception are shrinking and disappearing.

People have been forced to move when new transmission towers were erected. In the United States, the 1996 Telecom Act's section 704 prohibits communities from opposing towers based on health effects. The situation is similar in other countries.

Where to move to is difficult to decide, since new towers may appear at any time and almost anywhere. Moving can be costly, since most people with EHS cannot live in apartments and may even need to buy or build a less-toxic house that is not easily sold again for what it cost to build.

There have been some efforts to get local authorities to create low-radiation zones, such as in Sweden and France. They met strong opposition, despite that they were not even true white zones, as mobile phones could still be used there.

Privately creating a low-radiation zone is nearly impossible, since it will require ownership of a very large amount of land. Rural mobile phone towers can reach more than twenty miles (32 km) if there are no obstacles (trees, hills, buildings, etc.). A private zone would need to be in deep forest or in a canyon.

Trying to create such a zone with an ordinance would surely be challenged in court by landowners who see such restrictions as lowering their property values and restricting their personal freedom.

Until the day when there is a big public uproar, or the courts force their hand, the politicians will not do anything that defies the powerful mobile lobby. The wait will be long.

Zones protecting observatories

There are fortunately already several low-radiation zones. These zones are created to protect large radio telescopes which are able to pick up radio signals from remote stars and galaxies — signals so faint that a single mobile phone would drown them out. Even the spark plugs in a gasoline engine can disturb some of these sensitive instruments.

The Parkes observatory in Australia was intermittently disturbed in 1998 by a microwave oven that was opened too fast. It really doesn't take much.

Not all radio observatories need protection. Some listen to frequency bands that are not used for telecommunication. Some are used to communicate with satellites and space probes using separate frequency bands.

A few of these big dish antennas are placed in populated areas, such as the one on the campus of Stanford University near San Francisco, California.

Many radio observatories are placed in remote areas and protected by agreements with tower operators. A spokesperson for the Karl Jansky Very Large Array in New Mexico (pictured above) stated the following in an e-mail:

The National Radio Astronomy Observatory (NRAO) works with the National Science Foundation (NSF), the National Telecommunications & Information Administration (NTIA), as well as with local, regional, and national spectrum users to limit the detrimental impact of government and commercial spectrum use on astronomical radio telescope performance. Most radio telescope sites administered by the NRAO have special, geographic-based spectrum agreements that assist in keeping the radio spectrum used at that site useful for astronomical data collection.

The Hat Creek observatory is located in a mountainous area of rural Shasta county in northern California. They listen for radio signals from distant civilizations (SETI) as well as regular radio astronomy in the millimeter-wave bands that will soon be flooded with 5G communications.

We contacted the observatory to hear about how they protect themselves against the oncoming 5G onslaught, but they declined to answer. Presumably they have similar agreements.

There are several other radio observatories in rural areas of the United States, such as Goldstone and Owens Valley in California.

There are also radio observatories in many other countries. A list is available on Wikipedia. Look for large sites in rural areas.

Australia hosts some large radio telescopes that surely must have some sort of protection, such as the 64 meter (210 ft) instrument at Parkes (New South Wales) and the 70 meter (230 ft) instrument at Tidbinbilla.

The true radio-quiet zones

The gold standard in protection is a specific zone where everybody living or working there has to conform to radio-quiet stipulations (not just the tower operators). That means people there are not allowed to use mobile phones, walkie-talkies or have a wireless network (Wi-Fi/WLAN) in their homes or offices without special approval.

People who have a serious need for mobile communication, such as the police, may be issued special radios that operate in frequency bands that will not disturb the observatory.

The oldest such zone is in Green Bank, West Virginia, USA. It was created in the 1950s to protect the large radio telescope there. The zone is a circle with a 10 mile (16 km) radius around the observatory. The local police actually have equipment to detect if citizens violate the radio ban.

The area is mountainous and heavily forested, which helps protect the observatory from interference, such as from tourists driving through the area with their cell phones on (even if they don't get a signal).

The public is not allowed to drive close to the observatory, but there are tours in a bus with a diesel engine (gasoline engines radiate too much).

The Green Bank zone has become famous because several people with severe EHS have moved there and allowed journalists to visit.

There are other radio quiet zones. One is in South Africa about 300 miles (480 km) northeast of Capetown, near the town of Carnarvon in the Karoo region. The zone has a radius of 20 km (12.6 miles) to protect the Square Kilometre Array radio observatory. The project is described in the article "Stars and baas" (The Economist, January 2017).

The world's largest zone is in Western Australia, about 500 km (300 miles) northeast of Perth. It has an outer zone going out to 150 km from the observatory, and an inner zone of 70 km (43 miles). The zones are so large because the Murchison Observatory studies a wide range of frequencies, including lower frequencies that can travel great distances. Also, there is little protection from trees, as it is a desert area.

The Murchison Radio-astronomy Observatory is placed where it is because the area is largely depopulated, with just some mines and large cattle ranches (called cattle stations). The Murchison project is described in the article "Engineering the

world's biggest radio telescope" by Rachel Courtland in the December 2017 edition of IEEE Spectrum magazine.

Other radio-free areas

The Lord Howe Island is a part of Australia, but set in the Pacific ocean well off the coast of New South Wales. The island is 11 km (7 miles) long and 2 km (1¼ mile) wide.

The island caters to tourists who want to get away from the city and relax in the beautiful surroundings — and go through a digital detox, as mobile phones do not work there. The island has no mobile phone towers and the only Wi-Fi is at a café.

It may be feasible to move to the island permanently and get a job at one of the hotels, the golf course, bars or another part of the tourist industry. The island has enough tourist traffic to support a daily flight to Sydney.

Space-based communication

In a few years it is expected that literally thousands of low-orbit communications satellites will bring wireless internet to every spot on earth. How much this will raise the ambient microwave levels in remote areas is unknown. It is also unknown how the astronomical observatories will deal with this.

More information

This website has many other articles on how to live with EHS:
www.eiwellspring.org